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PRELIMINARY REPORT

of the

PENNSYLVANIA STATE PLANNING BOARD

TO THE HON. GIFFORD PINCHOT
GOVERNOR
OF THE COMMONWEALTH

AND TO

THE NATIONAL RESOURCES BOARD

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PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
 HARRISBURG PENNSYLVANIA
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HARRISBURG PENNSYLVANIA
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MAP OF PENNSYLVANIA

The map displays the following counties and their approximate locations:

- Westernmost:** Erie, Crawford, Mercer, Venango, Forest, Elk, Cameron, Clearfield, Centre, Lycoming, Sullivan, Wyoming, Lackawanna, Wayne, Pike, Monroe, Carbon, Northampton, Lehigh, Berks, Montgomery, Bucks, Delaware, Chester, Lancaster, York, Adams, Cumberland, Franklin, Fulton, Bedford, Somerset, Fayette, Washington, Allegheny, Beaver, Lawrence, Butler, Clarion, Jefferson, Cambria, Blair, Huntingdon, Mifflin, Juniata, Perry, Schuylkill, Northumberland, Dauphin, Lebanon, Berks.

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Governor's Office
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THE GOVERNOR

December 31, 1934.

To the Honorable Harold L. Ickes,
Chairman, National Resources Board,
Washington, D. C.

Dear Mr. Secretary:

I have the honor to transmit herewith the preliminary report of the State Planning Board of the Commonwealth of Pennsylvania, appointed by me in accordance with Circular Letter No. 5, of the National Planning Board.

I submit this report to you in conformity with my letter of September 21, 1934, in which I agreed to submit a preliminary report of the State Planning Board.

Respectfully transmitted,

Robert P. Fulton

To His Excellency,
The Hon. Gifford Pinchot,
Governor of Pennsylvania,
Harrisburg, Pa.

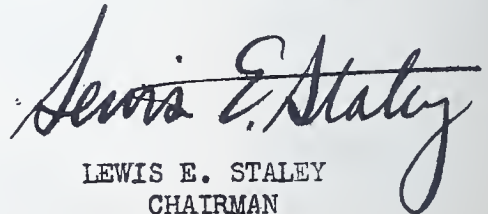
Sir:

The State Planning Board, appointed by you last Summer in agreement with the National Resources Board, herewith presents its preliminary report.

The findings and recommendations are submitted as the basis for planning a coordinated and adjusted economic program for Pennsylvania and as the groundwork for this State's participation in National and Regional Planning.

The Board has cooperated fully with the National Resources Board appointed by President Roosevelt, and has borne in mind the importance of correlating State and National programs.

Respectfully submitted,


LEWIS E. STALEY
CHAIRMAN

FOREWORD

President Roosevelt, in July, 1933, appointed a National Planning Board in the Public Works Administration. This was merged with the National Resources Board on June 30, 1934. The purpose of the latter board, according to the Executive Order creating it, was "to prepare and present to the President a program and plan of procedure dealing with the physical, social, governmental and economic aspects of public policies for the development and use of land, water and other National resources and such subjects as may from time to time be referred to it by the President."

Planning for the needs of a people is by no means a new movement. Its desirability has long been recognized. In the United States the movement has been thought of most often as town planning with adequate facilities for housing, transportation, recreation, zoning, or as metropolitan area planning in which contiguous, economically interdependent communities are defined by such things as the extent of free delivery from centrally situated stores, as distinct from political boundaries.

The Philadelphia-Tri-State Regional Plan, the Regional Plan for New York and the planning for Allegheny County are admirable examples of the latter. Their purpose is to provide a broad framework to which all future detailed plans of the various communities can be made to conform and, to a certain extent, be adapted to state-wide purposes.

The natural next steps were National and State planning. But National planning in the United States, if it is to be successful, must be a cooperative effort. The action of the State and of the National government are mutually interdependent.

The National Board, therefore, undertook to encourage the establishment of state planning boards by offering to supply to state boards for a limited period the services of competent consultants. As a result, planning boards have been set up in 41 states. In four of these, the state boards have been authorized by their legislatures to continue their work. Similar action is expected within the next few months in others.

The State Planning Board for Pennsylvania was appointed on July 23, 1934, by Governor Pinchot.

The task of the Board was to lay the foundation for a sound State plan, one that would be, insofar as is humanly practicable, directive - a set task - not a mere forecast. In this report will be found many facts and conclusions which not only demonstrate the need for a State plan but which can form the basis for one.

Some of the fundamental problems before the Commonwealth include the location and trends of population, the wealth of the State and the buying power of its people, housing, working conditions, unemployment, mineral and water resources, competitive situations faced by such important industries as

coal and iron, changing agriculture, transportation, education, social security and welfare.

In studying these subjects, the Board has considered, in general, a program looking ten years into the future.

A number of facts stand out. On these are based the main recommendations submitted by the Board. The supporting data will be found in the main body of the Report.

The various departments of the State government have done a vast amount of planning, each in its own field. They should continue to do so. None, however, has drafted a comprehensive plan embracing the purposes and needs of all the others in relation to itself.

Consequently, one of the recommendations contained in this Report is for a State Planning Secretary with the same official status in relation to the Chief Executive as is now the case of the Budget Secretary, and a permanent board of outstanding citizens and department heads.

The Planning Secretary would supervise State planning as the direct representative of the Governor and correlate State and Federal activities in this field.

Such a State official would correlate the planning by the various departments of the State government. Inventories of State resources would be made under his direction and kept up to date. Provision also should be made for special studies to assist the Legislature, if requested. The suggested legislation should provide for evolving short range plans to meet

immediate needs which may arise and for long term planning.

The outstanding conclusions developed from the Board's research do not form an integrated plan that will assure everyone in Pennsylvania reasonable security in an adequate standard of living. But they do look forward to that end.

If the suggestions included in this Report are adopted, they should insure a better opportunity for all citizens. They should assist in laying the basis for the integrated planning that must become a part of our united thinking.

The State Planning Board wishes to express its gratitude for the cooperation of the Governor and members of his Cabinet. The departments have provided invaluable assistance.

It also thanks the National Resources Board for the services of its Director and its Consultant, and the Work Division of the State Emergency Relief Board for authorizing use of the funds necessary for the employment of its staff.

The Board also is especially appreciative of the hard work done so generously by many employees of the State, frequently in periods outside their regular working hours. Many individuals in the Federal service or with private agencies have given unstintingly of their time in the preparation of sections of this Report, in reviewing portions and in advising with the members and staff of the Board.

The Board also extends its thanks to the authors of certain sections of this Report, whose names appear as footnotes on the first page of such sections.

PRINCIPAL FINDINGS AND RECOMMENDATIONS*

FINDINGS

Population

Pennsylvania's population shows a tendency to stabilize by 1960.

The birth rate probably will continue to decline.

The death rate, now declining, will begin to rise in another decade or two as the average age increases.

There will be fewer children and more adults.

Land and Its Utilization

From 1910 to 1930 taxes on Pennsylvania farm lands increased 159 per cent, farm mortgages 85 per cent and investment in machinery and implements 165 per cent.

From 1910 to 1930 prices of farm products increased only 47 per cent.

The State lacks a long time program of forest redevelopment.

The State needs information on flood control.

Many streams and other bodies of water necessary to human life are badly polluted.

Changes of tremendous importance have displaced many workers in the State's mineral industries, resulting in deserted areas or stranded populations, in some cases, and destitution in many others.

*See body of report for others.

Working and Living Conditions

Working conditions, minimum wages and hours of labor, have generally improved and are continuing to improve as one of the results of the NRA, but many classes of workers remain whose conditions require further consideration.

Income is most unequally distributed.

Marked technological improvements have increased the output per individual in the State's industries to such a degree that no places would be available for many now unemployed if business regained its former activity.

In the last 15 years relatively few dwellings have been constructed within the price range of a majority of the people.

If business activity were to increase and cause reemployment, families now doubling up would find a shortage of separate houses.

Less than one-third of the farm families in Pennsylvania use electricity.

The State lacks a program for the security of individuals but does make limited provision in certain instances through Mothers Assistance, Old Age Pensions and Pension for the Blind.

The Government has failed to accept the obligation to provide employment or to assume proper responsibility for industrial workers involuntarily unemployed by industry.

It is inconceivable, particularly in mass production industries, that a time will ever come under the most carefully planned program, when during a period of depression all unem-

ployed workers can be absorbed by a public works program.

The State lacks a coordinated program for public works adjusted to employment in depressions.

Industry, Trade and Transportation

Marked changes in industries and in their location are having serious effects on the workers dependent upon them.

Between 1929 and 1933, the number of stores had decreased 15 per cent, sales dropped 47 per cent and full time employes 31 per cent.

The trend is toward chain stores, particularly in the food groups, where the chains do 34 per cent of the total business with only 12 per cent of the stores.

Twenty-one per cent of the total retail stores of the State do 80 per cent of the business.

Industry uses three-fifths of the electrical power in this State and pays approximately one-third of the total bill, while domestic consumers use one-sixth and also pay approximately one-third of the total bill.

Pennsylvania's transportation system, covering railways, highways, airways, waterways and pipe lines, is not adequately coordinated.

Regulation of transportation is now attempted under a law not fully applicable to present day conditions.

Social Activities

More than 5600 taxing bodies exist in this State and many of them have outlived their usefulness and should be combined.

Changing population trends indicate need for more teachers and a greater variety of subjects in the high schools.

In the elementary schools the number of teachers needed will decrease during the next decade, if present population trends continue.

Movements of population and the improvement of transportation have changed the need for many smaller independent school districts.

Three and half million persons in Pennsylvania are without access to public libraries.

Many of the smaller cities and five counties have not a single library.

The State-aid program for the care of dependents is uncoordinated.

The present system of relying mainly on taxation of real property makes the carrying on of services by local units of Government exceedingly difficult.

RECOMMENDATIONS

The Board recommends:

Creation of the office of Planning Secretary as outlined in the Foreword.

Research with a view to maintaining the relative importance of Pennsylvania's mineral industries.

A long-time program of forest redevelopment.

A State program for purchase of abandoned and submarginal land for forestation.

Close integration of the purchase of land by the Game Commission with the work of the Department of Forests and Waters and with the Federal land-buying program.

Collection of information on flood control.

Rigid enforcement of laws for control of stream pollution.

A housing program based on a stable population rather than on unlimited speculative expansion.

Appropriate educational opportunities for the increasing number of youth between 18 and 21 years of age out of employment and out of school.

A continuing education for adults at all ages.

State aid for free libraries.

Expansion of the present system of old age pensions to supplant many almshouses, and the creation of larger almshouse units in geographical districts serving as institutions for chronic disabled aged.

A State-wide plan for the care of the mentally ill.

State industrial farms to replace the present county prisons.

Effective planning for rural electrical development.

Legislation

The Board recommends State legislation to:

Govern the use and development of streams, with a view to better allocation of water.

Preserve the gains achieved under NRA in respect to child labor.

Consolidate and make permanent the gains through NRA as to standards of wages and working hours.

Abolish company police and privately paid deputy sheriffs.

Set up machinery to facilitate collective bargaining.

Strengthen the Workmen's Compensation law.

Set up official county welfare boards through new administrative machinery, for poor relief, mothers' assistance, blind and old age pensions and child care under the supervision of the Department of Welfare.

Develop the proposed ten-year legislative program offering protection to children.

Provide that in the absence of available industrial or public employment, a direct money payment to assure at all times the minimum for an adequate standard of living for the worker and his dependents during involuntary unemployment.

Provide economic relief and other necessary home or

institutional care through a unified public relief agency to the chronic indigent, the maladjusted individual and similar groups now the concern of public or private relief agencies.

Create a State Housing Authority to make possible an effective housing program and to cooperate with the Federal program.

Completely change the State's system of school support so as to guarantee to every school district a foundation program and reduce local taxes on realty to their proportionate share of the total tax load.

Facilitate the merger of numerous existing school districts into fewer and more competent units.

Reduce the number of separate local units of government in order to increase the quality and reduce the cost of public service rendered.

Participate in the Public Works program and other Federal projects.

Further Studies

The Board recommends that further studies be made of:

Water supply needs for domestic and industrial use for the next 25 years.

Possible sites for hydro-electric development.

Power distribution and costs similar to that just completed by the Power Authority of the State of New York with a view to the possibility of lower rates to domestic consumers.

Soil erosion, abandoned farm lands and submarginal lands

now under cultivation with the view to development of a plan for use of submarginal lands.

Marketing of farm products, to develop a more satisfactory system of marketing.

The administration of unemployment relief and other forms of relief, grants or pensions in order to determine their ultimate integration.

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In addition to the many State employes and those of the State Emergency Relief Board, who have materially assisted us in the preparation of this report, we wish to express our appreciation for the great help given by the following:

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POPULATION

LOCATION AND TRENDS

The trend in Pennsylvania today is toward a stabilized population within the next twenty or twenty-five years. The effect will mean a fundamental if slow change in the needs and economic habits of more than nine and a half million persons. Equally significant is that the Commonwealth is headed toward an era in which a much larger proportion of the population will be in the older age groups, and one in which there will be a smaller proportion of children and young people.

How will this affect the present industrial, school and social structure? A small "child population" obviously will mean fewer primary schools, which in turn will affect the attendance in high schools, colleges and universities. Because of the increased share of the population of 45 years of age and over, a much wider program will be required to provide for this group either by work opportunities or otherwise. Schools for the rehabilitation of this untrained older group will have to be envisaged; old age pensions and the number of indigent people will increase appreciably, while health officials will become more and more concerned with the degenerative diseases now showing rising death rates.

If the picture is expanded a little more, it is found that a stabilized population in which the older groups are predominant will bring changes in the transportation system, housing problem and in a dozen other more or less related activi-

ties. Manufacturing plants geared to take care of the needs of children and young people will have to cater to the personal requirements of an older group. In short, a stabilized population, provided the present trend is maintained, will call for a gradual but inevitable readjustment in the life of the whole State.

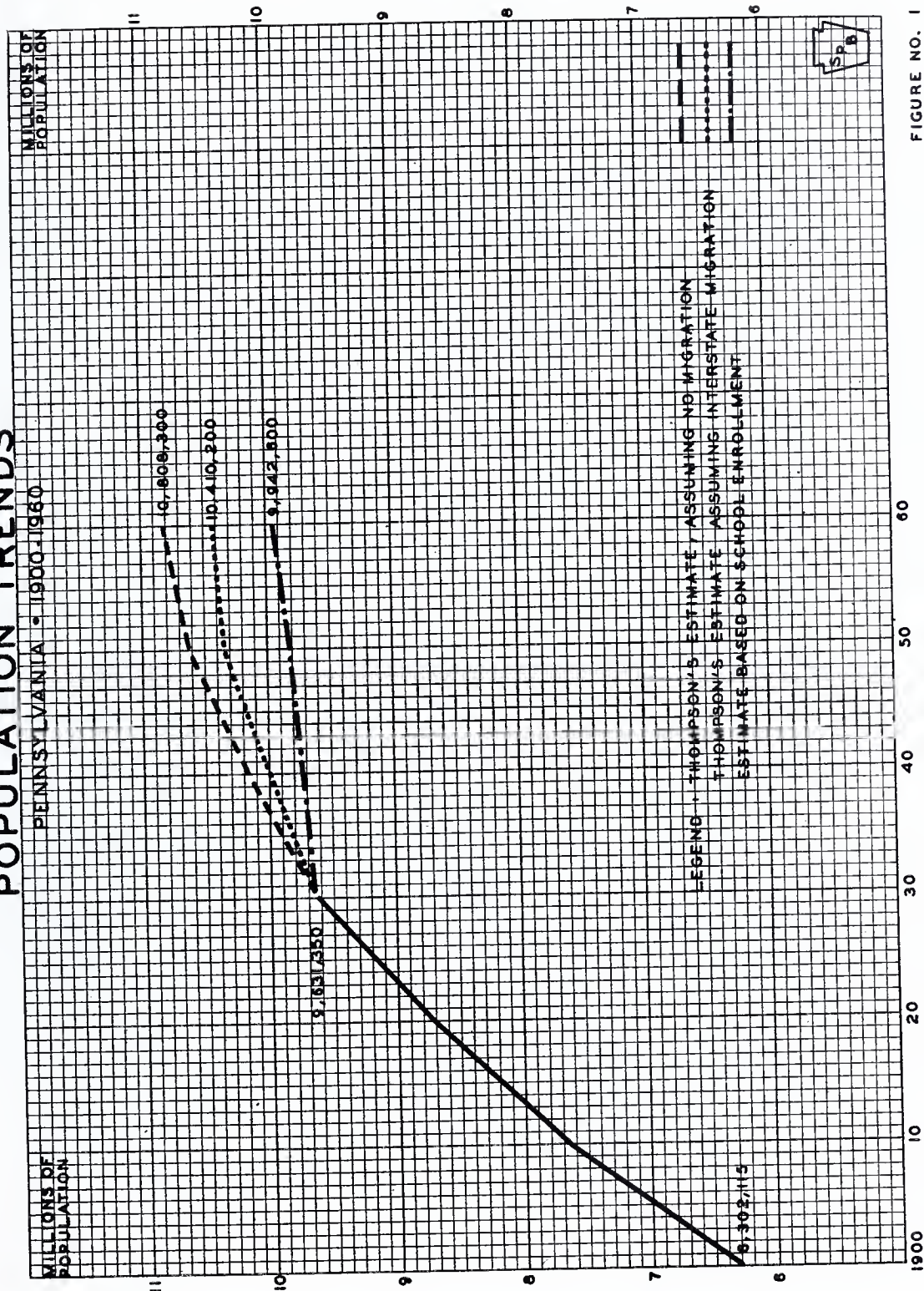
POPULATION

The total population of Pennsylvania in 1930 was 9,631,350, a gain in ten years of 911,333 or 10.5 per cent. Between 1890 and 1900, there was a growth of more than a million persons. The following decade witnessed the largest addition on record. The increment for the 1910-1920 period dropped to about 10,000 more than that of 1890 to 1900. This is explained by the World War with its casualties and its restricting effect on immigration, in addition to the excessively high death rate during the influenza epidemic of 1918. No such unusual explanations are found for the still lower figure for 1920-1930. During that time, immigration into the United States was drastically restricted. This naturally had its influence in Pennsylvania. Births and deaths were lower, but there was no one event or factor which would account for the smaller increase.

Since 1890, with the exception of 1900 to 1910, there has been a steady decline in the percentages of growth. That peak period showed a 21.6 per cent increase, while two decades later the percentage was less than one-half of it.

POPULATION TRENDS

PENNSYLVANIA - 1900-1960



PENNSYLVANIA POPULATION 1890 - 1930

TABLE 1.

CENSUS DATE	CENSUS POPULATION	INCREASE FROM PRECEDING CENSUS	PERCENTAGE OF INCREASE
June 1, 1890	5,258,113	975,222	22.8
June 1, 1900	6,302,115	1,044,002	19.9
Apr. 15, 1910	7,665,111	1,362,996	21.6
Jan. 1, 1920	8,720,017	1,054,906	13.8
Apr. 1, 1930	9,631,350	911,333	10.5

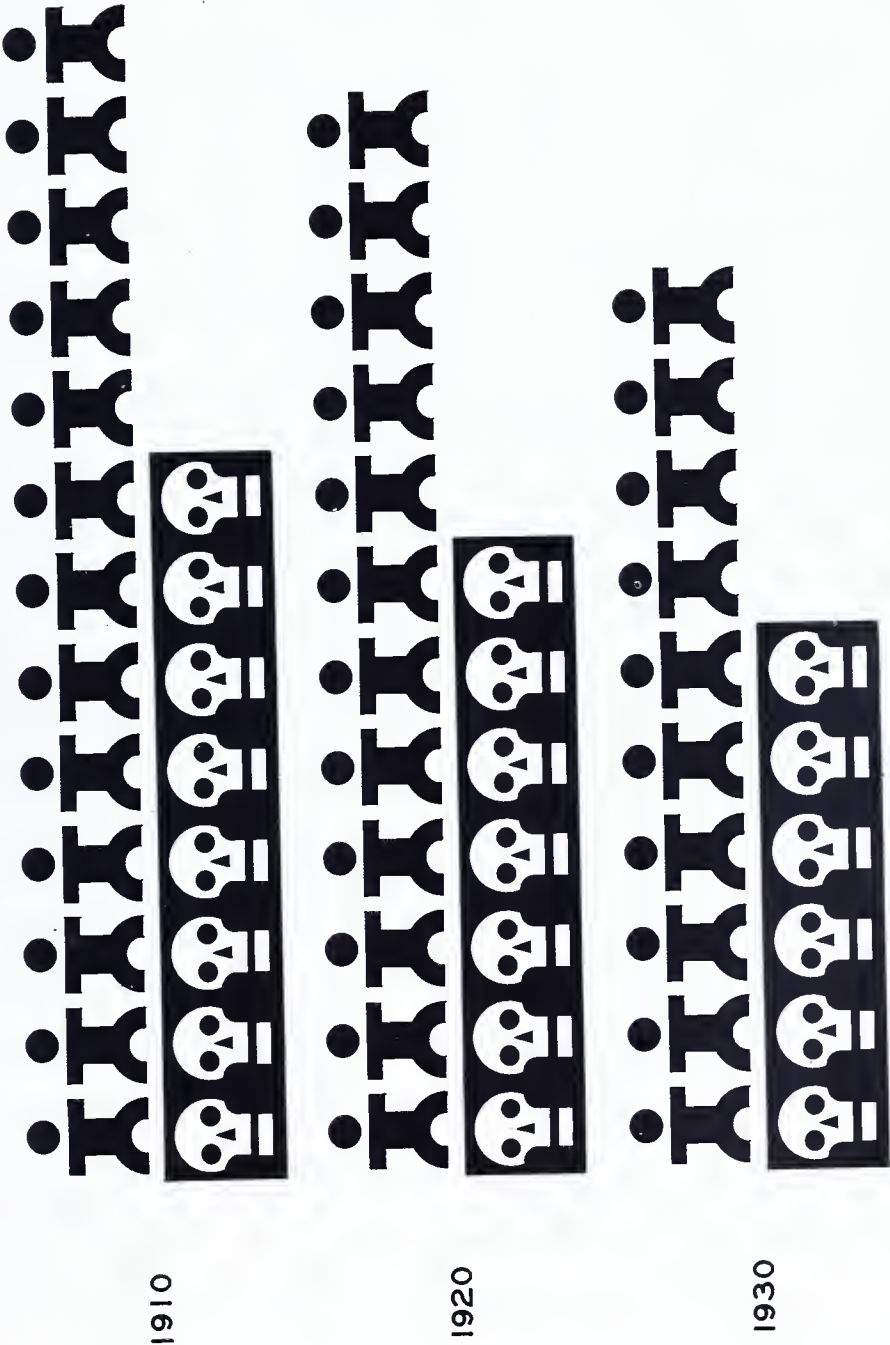
Whether such a marked slowing up will continue is problematical, but that a downward trend will persist is reasonable to suppose. The United States as a whole was showing the same movement, although at not nearly so fast a rate. States bordering Pennsylvania likewise indicated this trend, but it is to be noted that with the exception of Delaware, Pennsylvania had the lowest percentage of increase. Why was this true, and if undesirable, what should be done to overcome it? If this continues Pennsylvania will reach stabilization at an earlier date than these other states or the United States.

POPULATION OF PENNSYLVANIA AND BORDERING STATES 1920-1930

URBAN AND RURAL

TABLE 2.

STATE	TOTAL POPULATION			URBAN POPULATION			RURAL POPULATION		
	POPULATION 1930	INCREASE 1920 to 1930	PERCENTAGE of INCREASE	POPULATION 1930	INCREASE 1920 to 1930	PERCENTAGE of INCREASE	POPULATION 1930	INCREASE 1920 to 1930	PERCENTAGE of INCREASE
Delaware	238,380	15,377	6.9	123,146	2,379	2.0	115,234	12,998	12.7
Maryland	1,631,526	181,865	12.5	974,869	105,447	12.1	656,657	76,418	13.2
New Jersey	4,041,334	885,434	28.1	3,339,244	864,308	34.9	702,090	21,126	3.1
New York	12,588,066	2,202,839	21.2	10,521,952	1,932,108	22.5	2,066,114	270,731	15.1
Ohio	6,646,697	887,303	15.4	4,507,371	830,235	22.6	2,139,326	57,068	2.7
Pennsylvania	9,631,350	911,333	10.5	6,533,511	925,696	16.5	3,097,839	14,363	0.5
West Virginia	1,729,205	265,504	18.1	491,504	122,497	33.2	1,237,701	143,007	13.1



DECLINE IN BIRTH AND DEATH RATES
PER 1000 POPULATION



Population is based upon three factors - births, deaths and migration. All are important not only in themselves but in their relation to each other. Vital statistics are available for the State since 1906. Although the records do not extend over as long a period as was considered for census population, they are sufficient to present definite trends.

BIRTHS AND DEATHS

In 1910 there were 203,510 births, or 26.5 per 1,000 population. The largest number occurred in 1921, but the rate was only 25.9. By 1930 the number and rate had dropped to 189,458 and 19.6 respectively. This indicates the slowing up in reproduction, affecting not only the aggregate but the composition of the population as well.

The death rate is moving in the same direction, although not quite so rapidly as the birth rate. In 1906 there were 114,435 deaths, or 16.0 per 1,000 population. In 1910, the number had risen, but the rate was only 15.6. The influenza epidemic of 1918 contributed substantially to the record high general death rate of 22.0. Two years later this rate was cut down to 13.8 and 1930 showed 111,606 deaths, or 11.6 per 1,000 population. How much further the death rate can be reduced will depend, in part at least, upon the future composition of the population. At this point, it is sufficient to state that in 1930 a continued downward trend was indicated.

The excess of births over deaths, or the "natural increase," has varied widely, but on the whole it shows that the

source of future population is diminishing. Between the census of 1920 and 1930 the State gained 911,333 persons, but the natural increase for the decade was 967,788. This means that Pennsylvania would have had approximately 56,000 more persons in 1930 than were enumerated, but for migration.

By comparing the number of persons born in Pennsylvania but who were living in other states in 1930 with the number who were born in other states and, at the time of the census, were living in Pennsylvania, it is found that the Commonwealth lost 750,569 persons through interstate migration. The three preceding censuses showed losses, although not quite so large. This indicates that for the past twenty years, the State has been on the losing side insofar as this one factor is concerned. Among the native-white, 18.7 per cent of those born in the Commonwealth were living elsewhere in 1930; 21.8 per cent of Pennsylvania-born Negroes were residents of other states. Of those residing here in 1930, 8.6 per cent native-white and 65.7 per cent native-Negro, were born beyond its boundaries. In addition, there has been a shifting within the boundaries which further changes the relation of the urban and rural sections.

DISTRIBUTION

Of the total population in 1930, 6,533,511 or 67.8 per cent were considered urban. This included all incorporated places of 2,500 inhabitants or more and ten first-class townships. The latter were added to this subdivision at the last



BORN IN PENNSYLVANIA
LIVING IN OTHER STATES

BORN IN OTHER STATES
LIVING IN PENNSYLVANIA

POPULATION LOSS BY MIGRATION

EACH FIGURE = 200 000 PERSONS

census; therefore, the bases for urban and rural totals for 1930 and 1920 are not comparable. Excluding these townships from their 1930 classification, the urban centers gained 715,191 or 12.8 per cent, whereas the Commonwealth, as indicated, showed a gain of 10.5 per cent. In 1920 there were four cities over 100,000 population, Philadelphia, Pittsburgh, Scranton, and Reading. By 1930, Erie had joined this group. The gain in these five cities constituted 33.6 per cent of the actual urban gain. The cities in the 25,000 - 100,000 population class accounted for 20.8 per cent. Johnstown was the only one of this group which lost in total population. The remaining cities over 10,000 population made up 17.5 per cent of the urban gain. The remaining 28.1 per cent of this urban gain came in places of less than 10,000 inhabitants.

Of the seventeen cities which came into 10,000 population group for the first time, six were in Allegheny County, three in Westmoreland, and Ellwood City in Lawrence and Beaver. In addition, three townships were added to the urban population of Allegheny County. In the southeastern section is Montgomery County, which included three of the townships and one of these cities, and Delaware County with two of the townships. The other counties which showed the same development were Lackawanna and Luzerne, in the northeast portion of the State. In the former, Taylor entered the group, and in Luzerne, Kingston and two townships increased beyond the 10,000 popula-

tion mark. These facts indicate a concentration of urban centers in three separate areas in the State.

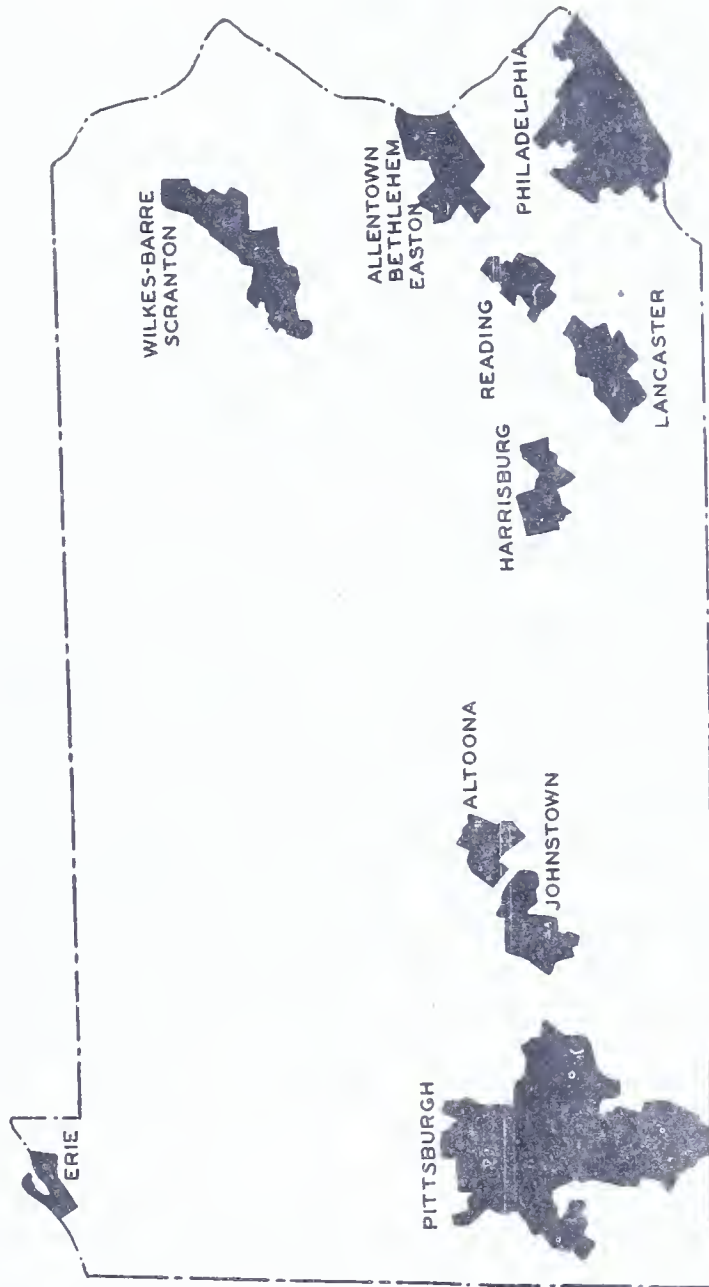
The ten first-class townships increased 97.5 per cent from 1920 to 1930.

According to the 1930 Federal census, there were ten metropolitan districts in Pennsylvania: Philadelphia, Lancaster, Reading, Allentown-Bethlehem-Easton, Harrisburg, Scranton-Wilkes Barre, Pittsburgh, Erie, Johnstown and Altoona. In 1920, 66.2 per cent of Pennsylvania's population was in these districts; by 1930 this had increased to 68.8 per cent. With the exception of Johnstown, the central cities in each district gained from 1920 to 1930 and in each instance they were located in counties which showed increased population during this period. These districts will remain the centers of population, but whether they will continue to increase in density or in size will depend largely upon future suburban movements.

Delaware, Montgomery and Bucks counties, which touch Philadelphia, showed a greater per cent increase from 1920 to 1930 than Philadelphia. Allegheny County, exclusive of Pittsburgh, increased at a higher rate than Pittsburgh. The country surrounding Lancaster, Harrisburg, Scranton, Easton and Reading likewise indicated a faster growth. This means that a suburban movement was in evidence. This was not true of Erie, Allentown, and Altoona.

Considering the metropolitan areas themselves, not the counties in which the central cities are located, the same

METROPOLITAN AREAS



U. S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS.

FIGURE NO. 4

facts are brought out. In the Allentown-Bethlehem-Easton district the area outside the central cities gained faster than the cities as a whole, or Bethlehem and Easton separately. Allentown showed a larger per cent increase than the rest of that district.

In the Erie and Altoona districts, the sections outside these cities showed losses of 16.1 per cent and 10.4 per cent respectively. In all the other districts and territory outside the central cities increased faster than the cities themselves.

A map prepared by C. W. Thornthwaite, who is making a study of population redistribution, gives the net migration of the State by counties.* This indicates the same trends in these districts except in Erie, where the county had a net gain, and in the Scranton-Wilkes Barre and Johnstown districts, where the counties showed net losses.

Since 1900 the urban population has predominated, gradually increasing in percentage each census until in 1930 it was 67.8 per cent of the whole. The rural forms but 32.2 per cent.

* Net migration was determined for each county by comparing decennial excess of births over deaths with the gain or loss in population as shown by the Federal censuses of 1910-20 and 1920-30.

PENNSYLVANIA POPULATION - URBAN AND RURAL
1880 - 1930

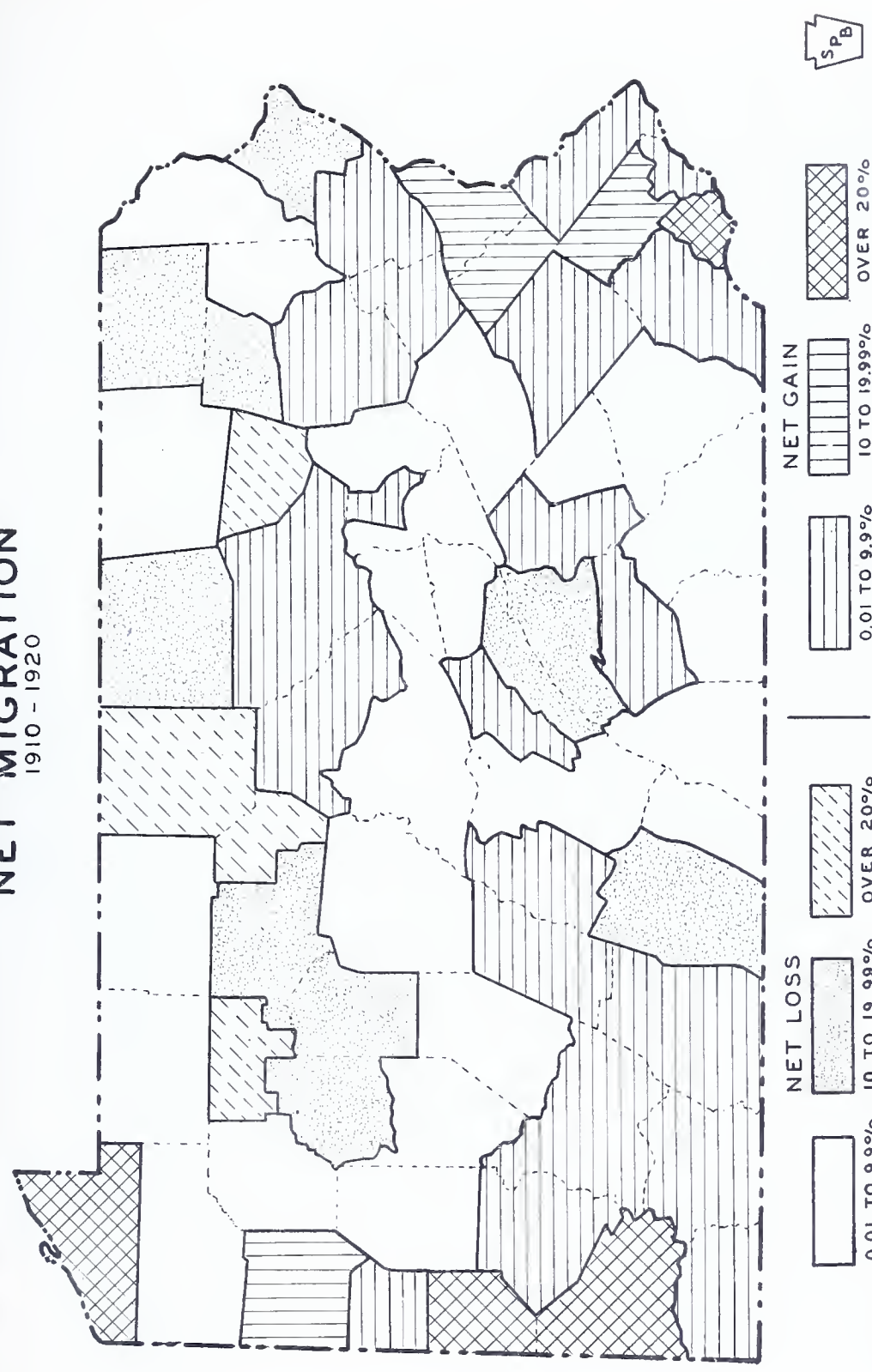
TABLE 3

YEAR	PERCENT URBAN	PERCENT RURAL
1880	41.6	58.4
1890	48.6	51.4
1900	54.7	45.3
1910	60.4	39.6
1920	64.3	35.7
1930	67.8	32.2

The change in the ten townships from rural to urban made a difference when comparing the 1920 and 1930 census figures. If the 1920 ruling is considered, the rural gained considerably by 1930, but under the latter classification a 0.5 per cent loss is recorded. By subdividing the rural figures into those for rural-farm (that population which is strictly rural) and rural non-farm (people residing in small villages and in circumstances which are neither urban nor farm), a more detailed picture is obtained, showing that it was the rural-farm section which declined. From 1920 to 1930 there was a 10.1 per cent decrease, while the rural non-farm increased 3.7 per cent.

There were nineteen counties in the State in which fewer people were living in 1930 than in 1920. The 1930 totals in

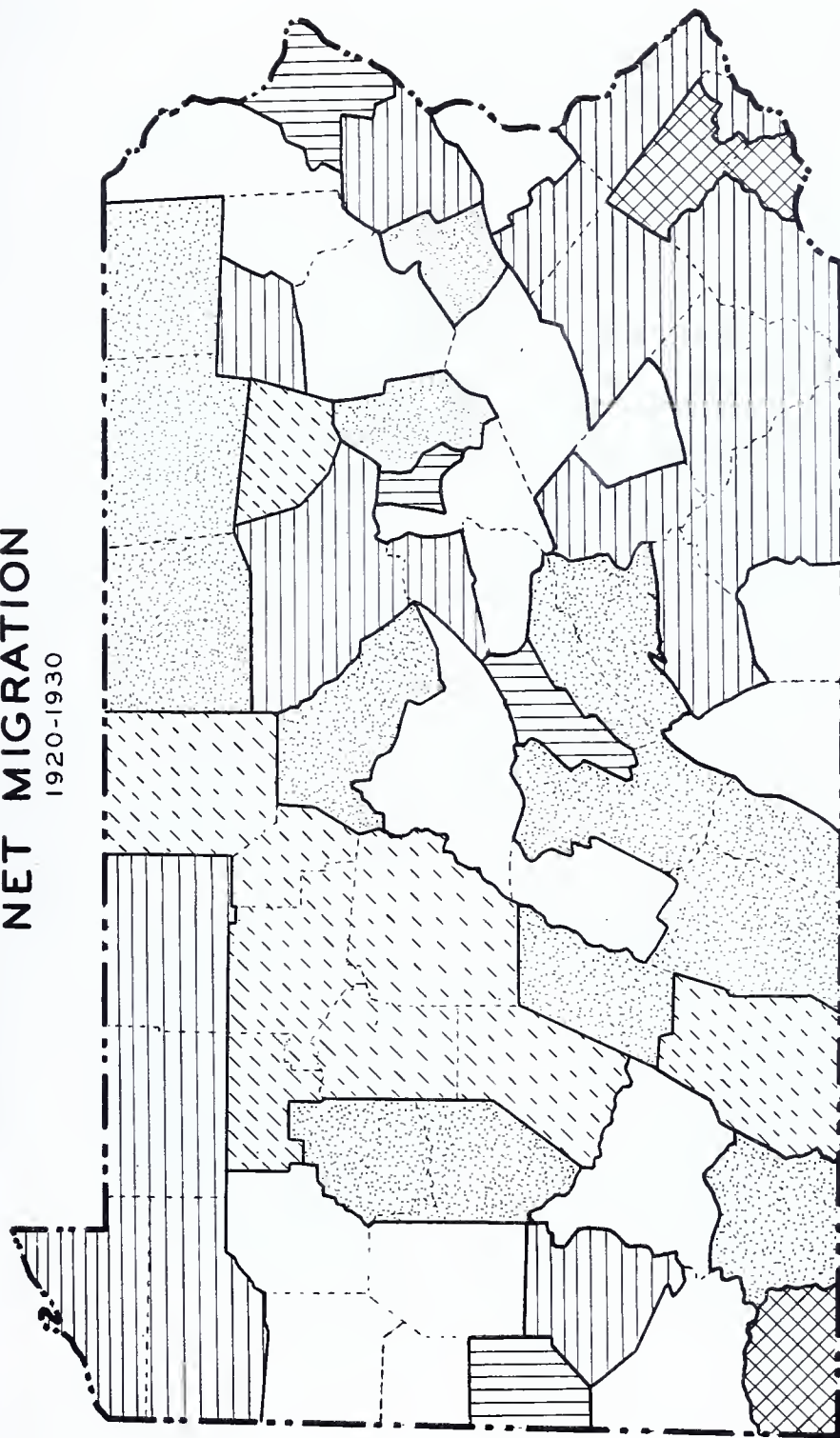
NET MIGRATION 1910 - 1920



COURTESY OF C. W. THORNTON
THE STUDY OF POPULATION REDISTRIBUTION

FIGURE NO. 5

NET MIGRATION 1920-1930



NET LOSS

0.01 - 9.9 %

10 - 19.9 %

20 OR MORE

PERCENTAGE BASED ON 1920 CENSUS

NET GAIN

0.01 - 9.9 %

10 - 19 %

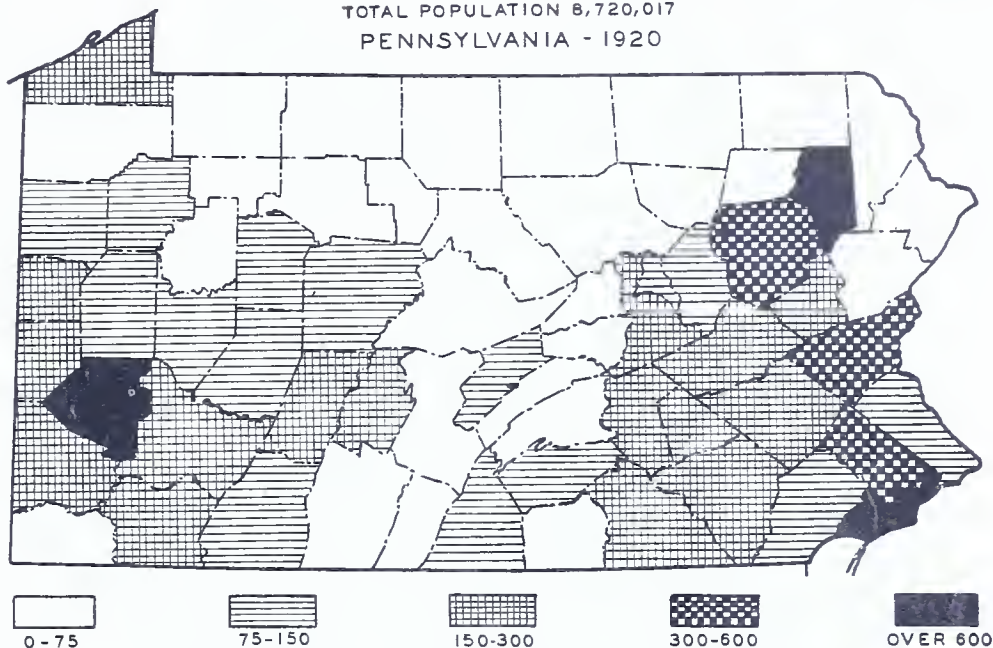
20% OR MORE

FIGURE NO. 6

COURTESY OF C.W. THORNTON
THE STUDY OF POPULATION REDISTRIBUTION

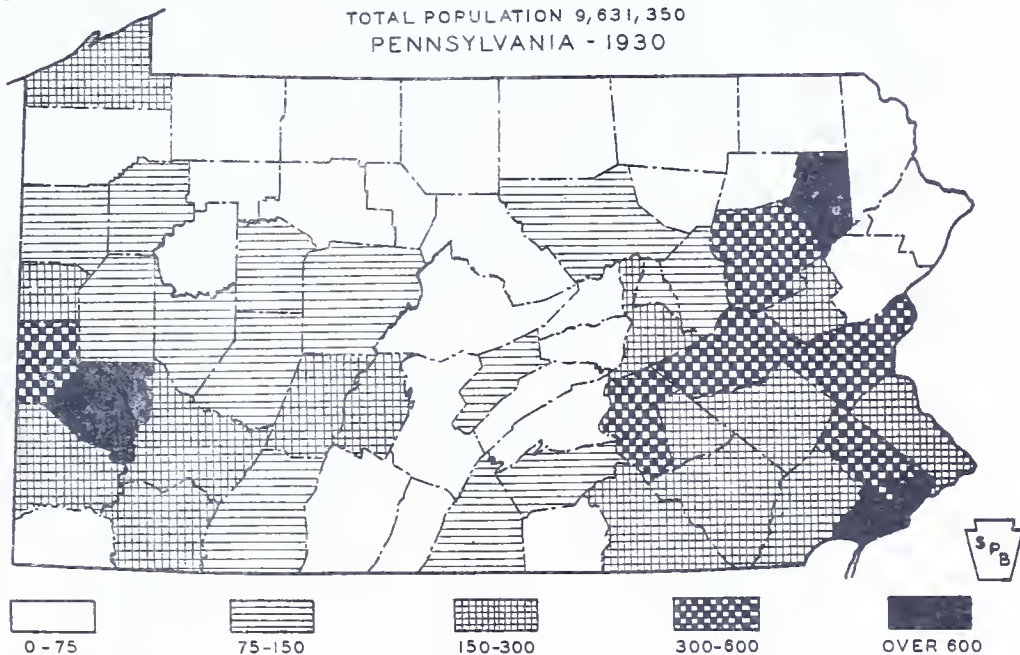
POPULATION PER SQUARE MILE BY COUNTIES

TOTAL POPULATION 8,720,017
PENNSYLVANIA - 1920

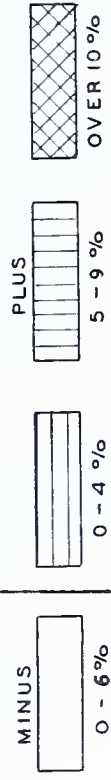
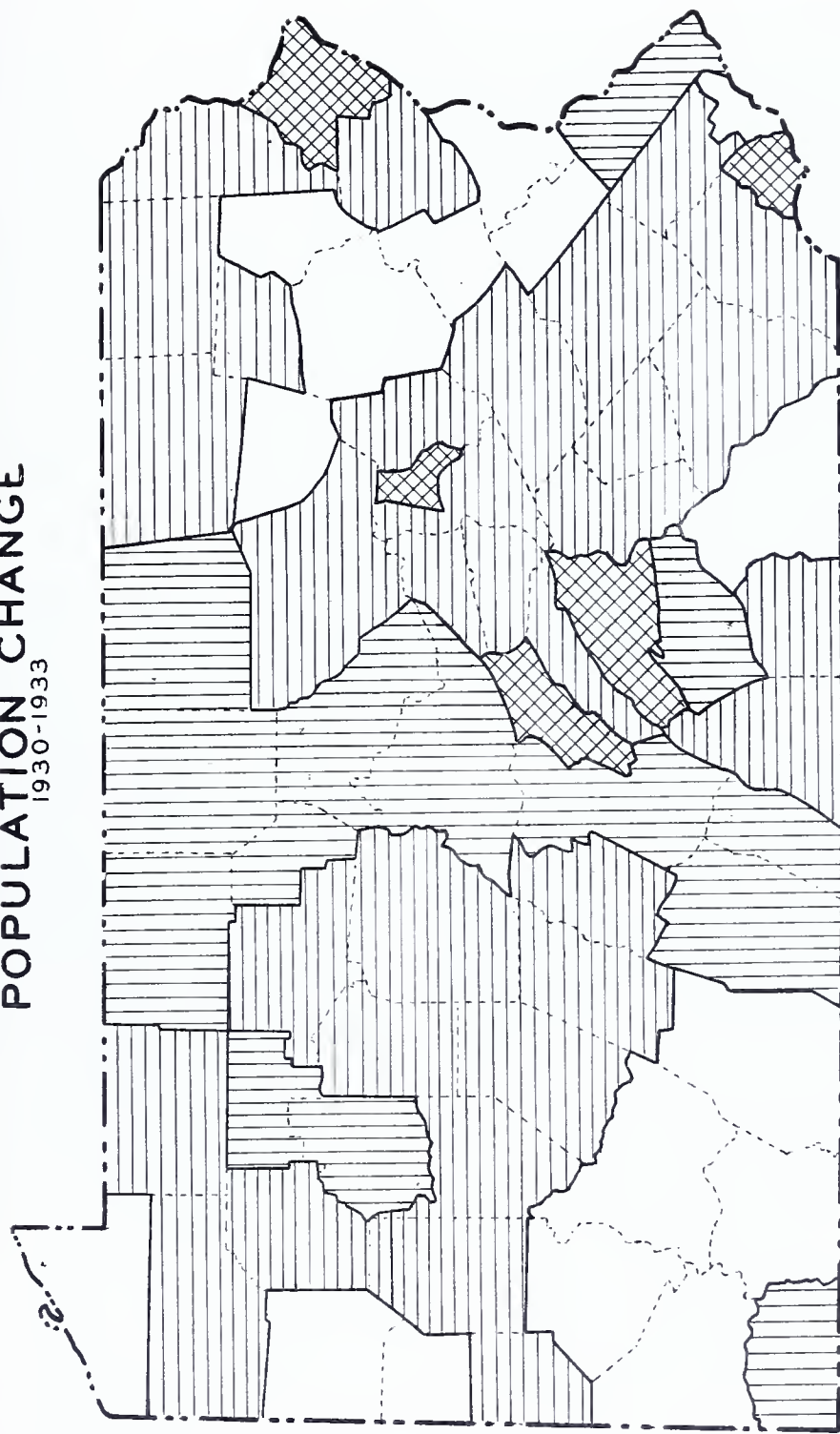


POPULATION PER SQUARE MILE BY COUNTIES

TOTAL POPULATION 9,631,350
PENNSYLVANIA - 1930



POPULATION CHANGE 1930-1933



Sp B

FIGURE NO. 8

BASED ON SCHOOL CENSUS - 1933 ESTIMATE

twelve of these did not even equal their 1900 figures. These counties include those in the northern tier, Potter, Tioga, Bradford, Susquehanna and the adjoining counties, Cameron and Sullivan; four in the central and southern areas, Juniata, Perry, Bedford and Fulton, and toward the northwest, Jefferson and Forest. During the last decade, Clarion, Clearfield, Elk, Clinton, Indiana, Huntingdon and Somerset also lost. In general, the losing counties form one band across the northern part and another north and south through the middle of the State. These counties are primarily rural in character. Lock Haven with 9,668 inhabitants is the largest community in the group.

Since the downward trend in the majority of these counties has extended over a period of years, it is reasonable to assume that it will continue in the future.

In twenty-nine counties the rural population gained during the decade under review. These are located along the western border and in the eastern section of the State, in general where the larger urban communities are found, although in nine of these counties were there no cities over 10,000 population.

The reasons for this growth are varied. Some of the counties are in good farming sections, while in others the increase may be traced to the excess of births over deaths. In still others the propinquity to urban centers may have influenced the growth of the surrounding rural sections. This would be especially true of such sections included in metropolitan districts.

The movement of people within the State is clearly illustrated by maps showing the density of population by counties. A definite southeastern and southwestern trend is evident. The sparsely populated counties, many of which are in the losing class, are seen clearly in the northern and middle portions of the State.

On the whole, it seems probable that future population maps of Pennsylvania will be much the same as the 1930 map in regard to urban and rural distribution, although there may be variations in density due to the widening of the metropolitan areas. Better transportation facilities will enable people to move away from the congested districts, or high taxes may drive industry into the smaller communities. On the other hand, with improved farm machinery and a continuance of farm abandonment, less people will be found in the strictly rural sections. Thus it appears that the rural non-farm and suburban communities will show the greatest gains in the future.

AGE DISTRIBUTION

The age distribution of Pennsylvanians proves that the population is growing older. In 1920, 11.5 per cent of the people were children under 5 years of age. In ten years this had decreased to 9.3 per cent, indicating the direct effect of the declining birth rate from 26.1 per 1,000 population in 1916 (the first year which would control the 1920 total for children under 5 years), to 19.6 in 1930. Obviously with a continued downward trend in the birth rate, the number of

AGE DISTRIBUTION

PENNSYLVANIA • 1900 - 1930

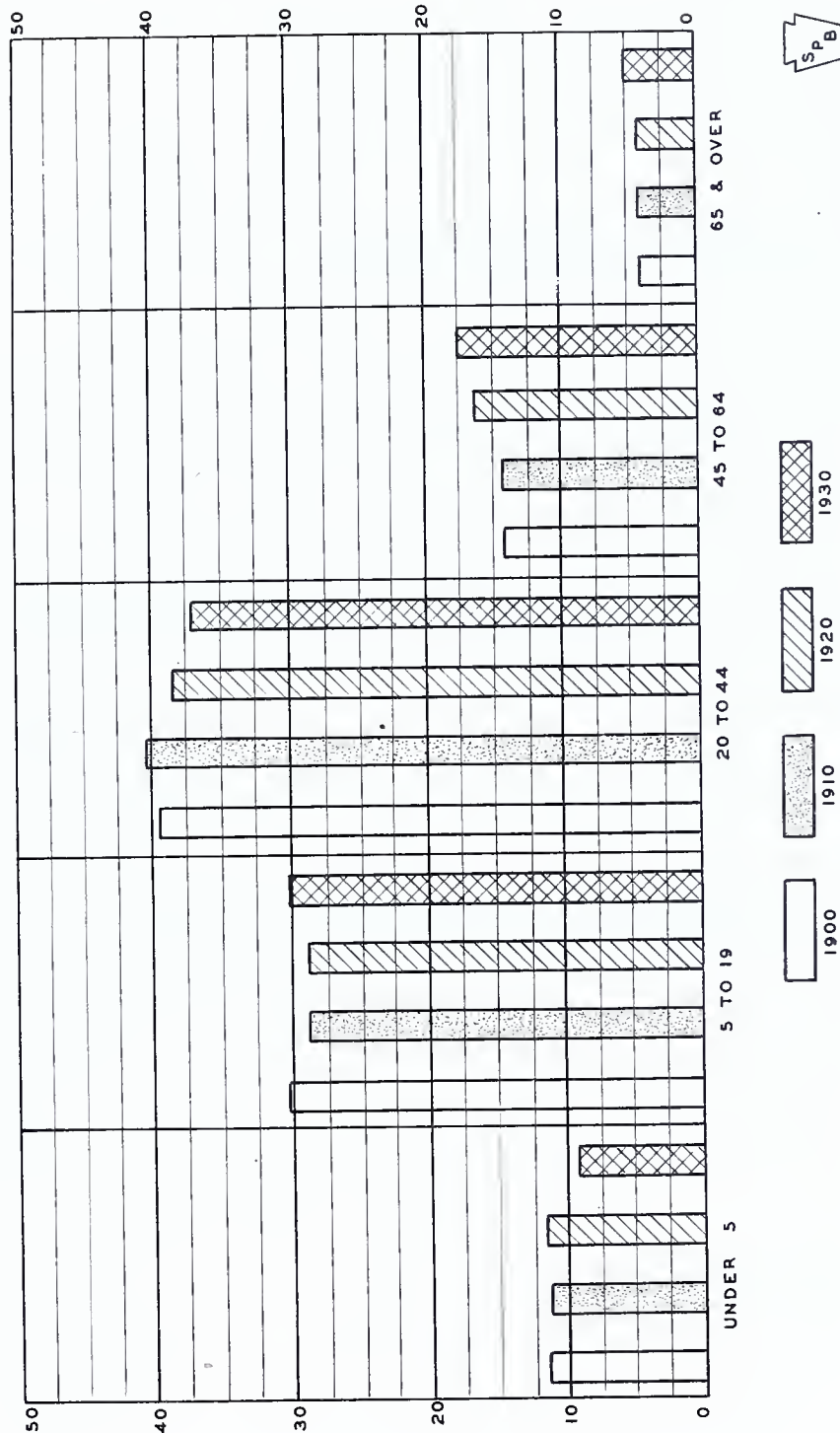


FIGURE NO. 9

POPULATION BY AGE GROUPS AND SEX

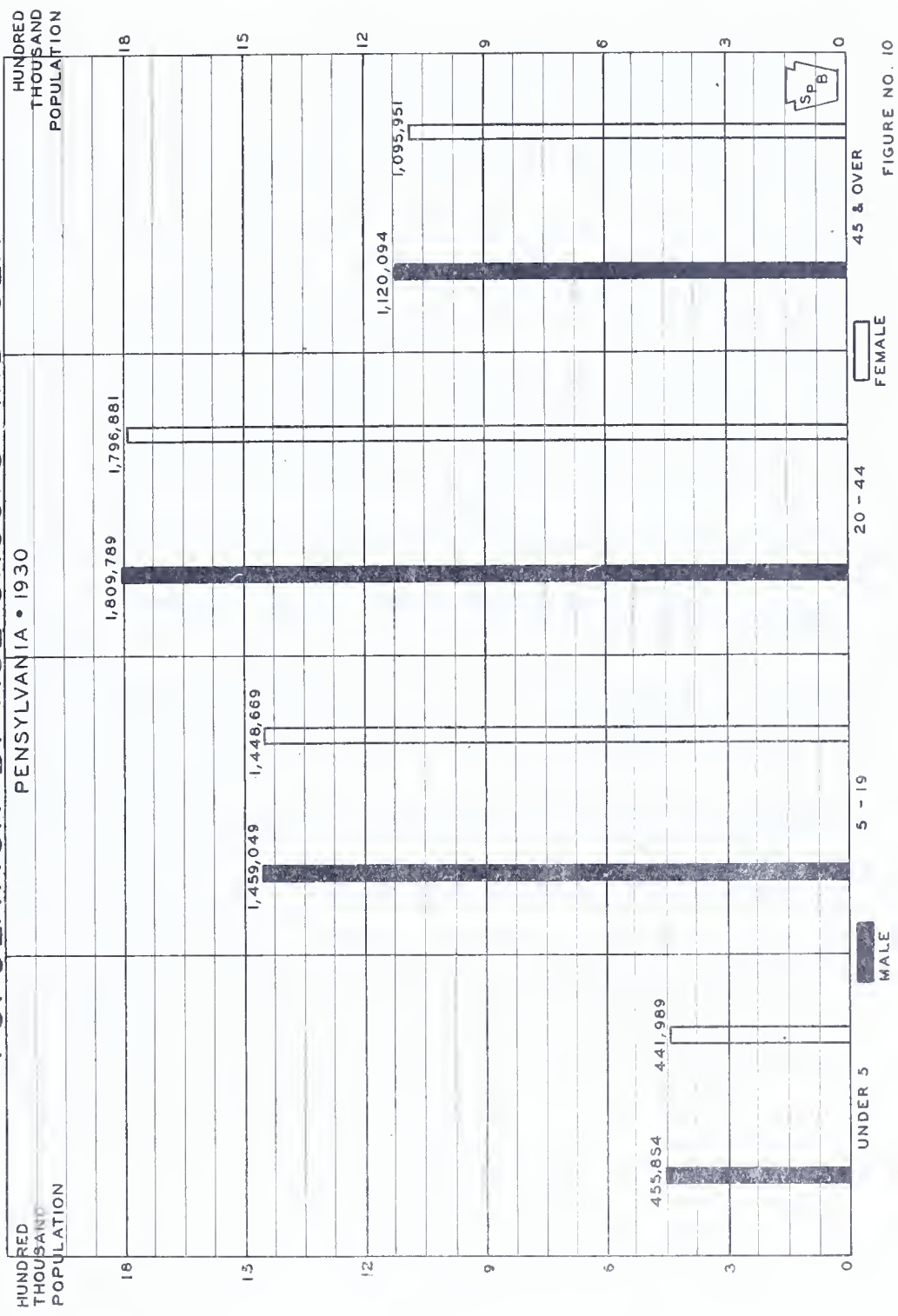


FIGURE NO. 10

children, in future years, will be correspondingly fewer.

In the older age periods, there were actually and proportionately more older people in the Commonwealth in 1930 than in 1900. During that time there was a 5 per cent proportional increase in the group 45 years of age and older. There were slight variations in the middle age group.

The foreign-born are the oldest, slightly more than one-half being between the ages of thirty-five and fifty-four. Naturally with continued aging of this group, in addition to restricted immigration, the possibility is remote that enough young people will enter the State from abroad to over-balance the large older age group, despite the fact that the death rate for the latter is certain to increase. The advance ages of foreign-born women will be noticeable especially in the birth rate. Among them, fecundity is higher than among the native whites, so that as they pass beyond the child-bearing age the birth rate will fall. The decrease of their children in the under-age-five group from 409,144 in 1920 to 247,505 in 1930 shows clearly the effect of age upon the foreign-born and the reduction in their numbers.

PENNSYLVANIA POPULATION 1930 BY AGE AND NATIVITY

AGE GROUPS	STATE	NATIVE WHITE	FOREIGN-BORN WHITE	NEGRO	OTHER RACES
State Total	9,631,350	7,959,551	1,233,051	431,257	7,491
Under 5 Years	895,843	853,757	2,008	39,345	733
5 to 14	1,989,211	1,894,916	19,772	73,660	863
15 to 24	1,732,415	1,575,856	80,372	75,108	1,079
25 to 34	1,435,705	1,137,497	200,700	95,296	2,212
35 to 44	1,357,057	929,344	351,437	74,819	1,457
45 to 54	1,033,505	697,691	290,066	45,045	703
55 to 64	674,262	486,080	169,755	18,098	329
65 to 74	367,460	272,769	87,823	6,790	78
75 years and over	140,818	107,775	30,445	2,569	29
Unknown	5,074	3,866	673	527	8

During this period, the older negro people remained proportionately the same, while the young and middle age groups varied. There were higher percentages among the children under fifteen years in 1930 than in 1920. Some of the middle age groups increased while other decreased, which may be explained by the large migration of negroes in the ten-year period.

For the State as a whole, in the age groups under fourteen, the boys out-number the girls. From the ages of fifteen to twenty-nine the opposite exists. In the large age group of thirty to sixty-four, the men are more numerous, but after that (sixty-five and over) the women predominate. The preponderance of males in middle age periods is due largely to the fact that the foreign-born are principally in that group, and among them the men far outnumber the women. The distribution varies for urban and rural sections. In the urban, the male predominates only in the age groups under ten and between thirty-five to fifty-four. In the rural, he is more numerous in every group except in the seventy-five-year and over class.

Pennsylvania's urban population was in general older than the rural. In the former in 1930 the children under ten amounted to 18.3 per cent of the whole, one-fourth of the inhabitants were in the thirty-five to fifty-four group, and approximately one-sixth in the older group. In the rural-farm area, the percentages for the under 10 class dropped from 21.7

to 20.8 during the ten years and in the rural non-farm they fell from 26.0 to 23.5. The higher birth rate in the rural sections and the economic value of children on the farm accounted in part for the fact that there were more children in the rural population. But here too the percentage of children was dropping. Men and women from twenty to thirty-four years of age moved to the urban centers, with the result that boys and girls under twenty and men and women over thirty-five predominate on the farms.

SEX

Men and women are fairly equally represented in Pennsylvania. In 1930, there were 101.2 males to 100 females. Although the ratio remains in favor of the boys at birth, their death rate, which is higher than that of girls, results in fewer men in middle life. Since the male death rate is also higher than the female rate for older people, the aging of the population will bring about a still closer sex ratio. Another element that will bring this about is the large proportion of foreign-born males to females. With restrictions on immigration, this group has had less and less influence on the composition of the whole population.

The proportion of males to females among the white population was practically the same as that for the State as a whole for 1920 and 1930. Subdividing the white population into native-white and foreign-born, it was the female in the former and the male in the latter which predominated. The

latter group also had the highest ratio in 1920, 129.6 foreign-born white males for each 100 females; in 1930 it had declined to 117.2. Among the Negroes, the males were also more numerous.

The last census showed more women in the urban centers than men, while the opposite was the case in the rural areas. This has been true for the country districts for at least the past three censuses. In the urban classification, it was only among the foreign-born and Negro that the males outnumbered the females.

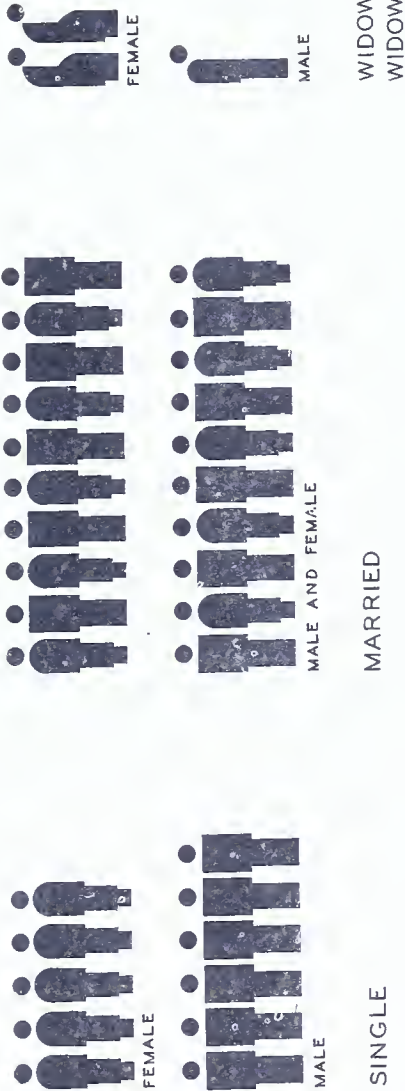
Marriage statistics for 1930 show that of the population fifteen years of age and older, 59.6 per cent were married, 31.9 per cent were single, 7.7 per cent were widowed and 0.7 per cent were divorced.

PENNSYLVANIA POPULATION - URBAN AND RURAL

BY SEX AND NATIVITY 1930.

TABLE 5.

	STATE		URBAN		RURAL	
	Male	Female	Male	Female	Male	Female
State Total	4,845,517	4,785,833	3,240,853	3,292,658	1,604,664	1,493,175
Native white	3,955,902	4,003,649	2,535,692	2,650,428	1,420,210	1,353,221
Foreign-born white	665,438	567,613	512,983	454,078	152,455	113,535
Negro	218,412	212,845	186,942	186,638	31,470	26,207
Other races	5,765	1,726	5,236	1,514	529	212



MARITAL CONDITIONS IN 1930
15 YEARS AND OVER



FIGURE NO. 11

PLANNING
BOARD

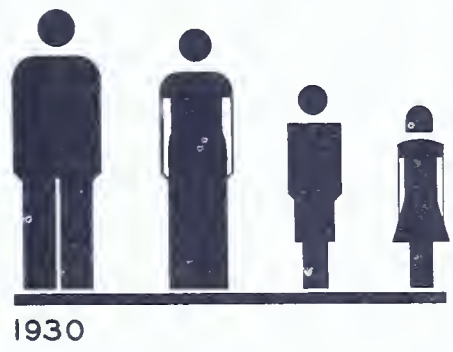
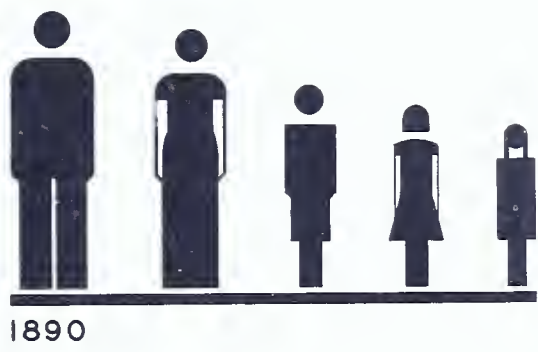
Considering the sexes separately, the percentage of married persons is exactly the same for both, but the percentage of single men is higher than that of single women. These were balanced by 10.6 per cent widows and only 4.8 per cent widowers.

PENNSYLVANIA POPULATION BY AGE* AND SEX. 1930

TABLE 6

AGE GROUPS	SINGLE		MARRIED		WIDOWED	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
State Total	1,183,086	971,131	2,018,874	1,999,302	161,432	357,068
15 to 24 years	744,768	629,948	107,809	240,631	691	2,291
25 to 34 "	213,416	142,458	488,585	556,601	6,151	14,592
35 to 44 "	104,394	76,993	569,533	535,694	16,653	38,886
45 to 54 "	63,770	55,401	436,811	371,566	29,029	66,261
55 to 64 "	35,382	36,933	265,222	204,135	37,883	89,040
65 to 74 "	15,936	20,616	120,645	76,398	42,309	89,233
75 and over	4,460	8,011	29,262	13,363	28,539	56,431
Unknown	960	771	1,007	914	177	334

* 15 years of age and older.



SIZE OF PENNSYLVANIA FAMILIES

FIGURE NO. 12



Approximately three-fourths of the foreign-born population of both sexes are married, while among the native whites there was a higher proportion of single men and women than for either the State as a whole, the foreign-born or the Negro. There were more married negro women than men.

The number of marriages in Pennsylvania has declined and the rate, which is the number of persons married per 1,000 population, likewise has dropped (from 19.2 in 1920 to 13.4 in 1930).

The size of the families in the State also showed a decline, not rapid but constant, as shown by the chart.

NATIVITY

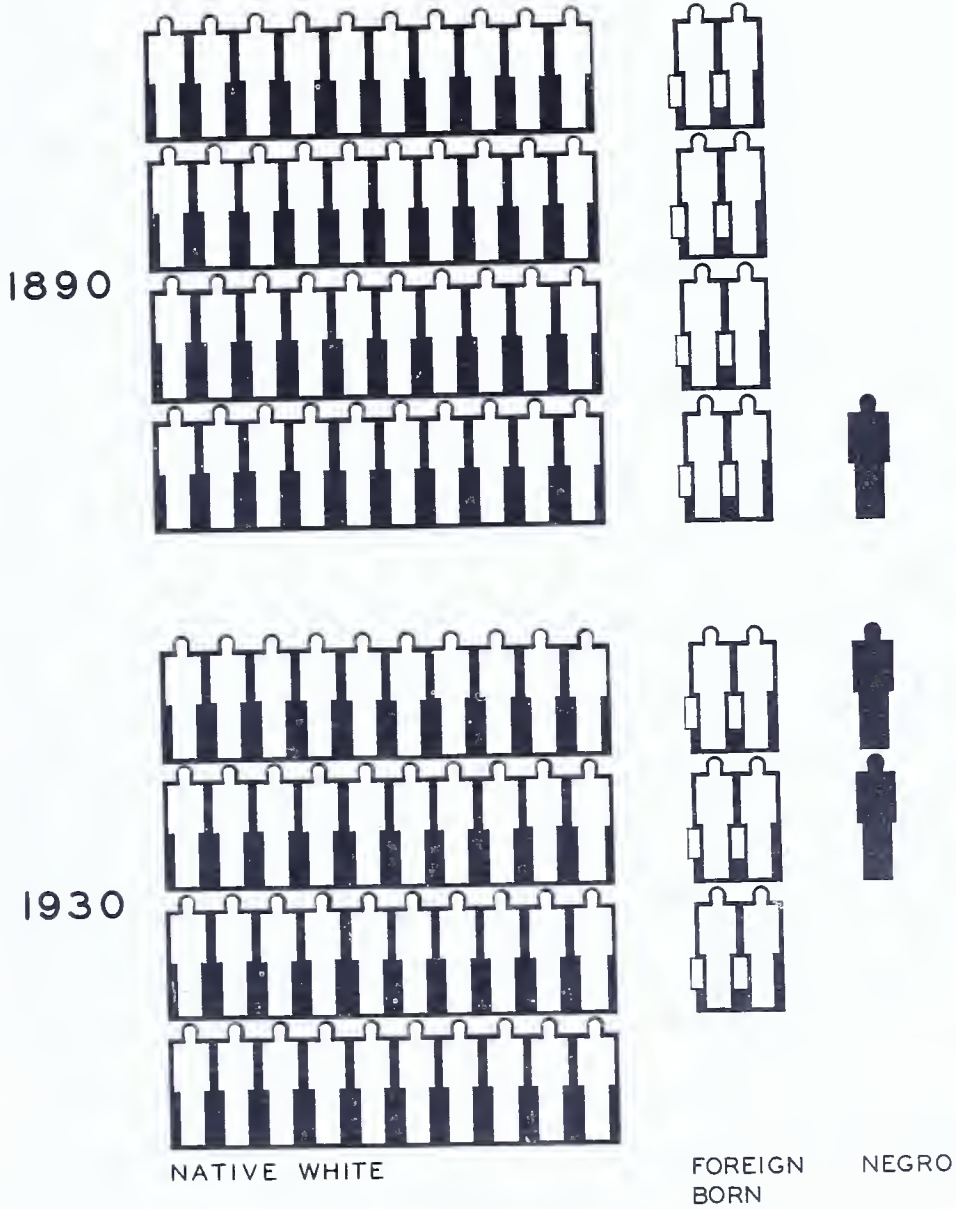
The population in Pennsylvania in the period under review was 95.4 per cent white, 4.5 per cent Negro, with the remaining 0.1 per cent composed of Mexicans, Chinese, Filipinos, Indians, Japanese and less than 100 "others." The whites are subdivided into the native and foreign-born, the former composing 82.6 per cent and the latter 12.8 per cent of the total population. Foreign-born whites have steadily decreased since 1910. From 1920 to 1930 there was a loss of 11.1 per cent in actual numbers. Unless immigration quotas are changed, the trend here indicated will continue even more rapidly.

The foreign-born have settled in the urban centers of the State. In 1930, 78.4 per cent were living there, with only 3.2 per cent in the strictly rural sections, while 18.4 per cent were in rural non-farm areas. It is noted that it was

not the large cities to which these people migrated. Of the places over 100,000 population only Reading gained and then but 0.1 per cent. Scranton lost 11.0 per cent; Pittsburgh, 9.3; Philadelphia, 7.3; and Erie 0.7. Of the other cities over 25,000 only seven showed gains, none of which were large. In the 10,000 to 25,000 group it was the smaller communities which showed an increase.

The negro population has steadily grown, not only in actual numbers but in percentages of gain. During the decade 1920 - 1930, the increase was 51.5 per cent, due mostly to interstate migration. In 1920, 84.3 per cent lived in the cities; in 1930, 86.6 per cent. Unlike the foreign-born, the negro flocked to the large centers. In Philadelphia, there was an increase of 63.6 per cent. In Pittsburgh they gained 45.7 per cent and in Chester, 29.8 per cent. In only a few of the larger cities was there a decrease and, with the exception of Johnstown and Sharon, the loss occurred in towns where the negro population was less than one per cent of the whole.

From this study of the census reports, it is evident that certain trends had developed by 1930, chief among which was the general slowing up in the rate of population growth not only for the State but for most of the metropolitan cities and for some of the rural counties. Through interstate migration, Pennsylvania was losing more than it gained, although there was a large influx of negroes. A faster declining birth rate than death rate, and the maintaining of the present Federal immi-



CHANGING PROPORTIONS OF THE POPULATION

FIGURE NO. 13



gration restrictions indicated a continuation of the slowing-up process. A suburban movement had also started, especially in the southeastern and southwestern sections of the State. The aging of the population, which had been in progress for some time, became even more apparent.

MOVEMENTS OF POPULATION, 1930-1934

The 1930 census, taken soon after the beginning of the depression, did not reflect adequately the effect which the economic crisis had upon movements of the population. Men and women, out of work, went from place to place seeking employment. In some instances, this meant that entire families changed residence; on other cases, one or two members. Many city families when faced with a reduced income moved to cheaper houses, often to small plots of ground, to raise food to supply their needs. "Doubling up" of families and the great transient group which developed meant another shifting of the population.

From 1930 to 1934 these marked movements in population grew in numbers and significance. The Federal census results consequently could be depended upon only for 1930.

Unemployment was growing to such proportions that definite data were necessary in order to cope with it advantageously. To obtain this information a census was undertaken in 1934 as a Civil Works Administration project. This enumeration was made in April, except in Philadelphia and Pittsburgh, where it was taken in February. The final results were checked against

other survey figures and against school censuses. While these did not agree entirely, the variations were very slight in most cases. For this reason, the Unemployment Survey is considered accurate and reliable. The strictly rural sections of the State were not included in the census-- only cities, boroughs and unincorporated communities of a commercial or industrial character were enumerated.

This survey shows the results of migration, both interstate and intrastate. Undoubtedly the movement of population out of Pennsylvania, which was well defined by 1930, was accentuated by the depression. To this can be credited much of the loss shown by the 1934 figures. Shifting of population from rural to urban and vice versa usually follows periods of industrial activity or depression, but unfortunately the exact extent of this movement within the State cannot be determined. It is established, however, that the drift toward the smaller urban communities, noticeable in 1930, was accelerated by the economic crisis.

According to the survey, the gains from 1930 to 1934 occurred in the smaller places and in the sections which are not distinctly urban. In communities having less than 5,000 inhabitants, approximately one-half showed increases varying from 0.1 per cent to a few cases where the population doubled itself. In the 5,000 to 10,000 class slightly more than one-fourth added to their 1930 totals, while in the 10,000 to 25,000 group only one-seventh increased. None of the cities over 25,000

population showed any gains. An accompanying table shows the shift in population of the State's larger cities and boroughs.

Pennsylvania's population computed on the basis of the school census for 1933 (the last year for which complete totals were available) has been checked against the 1934 survey. Both presented the same picture but the estimate is more accurate because it included the entire State.

This estimate showed that the population of first-class school districts, Philadelphia and Pittsburgh, had a 3.14 per cent decrease from 1930 to 1933. The second-class districts lost 2.35 per cent while the third-class gained 0.15 per cent.* From these changes, it appears that the slowing up in the rates of increase in the larger centers which the 1930 census indicated, was so marked during the three-year period since that enumeration that in most instances there was an actual loss. The indication of the movement to the smaller urban places is verified likewise.

The population of fourth-class districts shows a gain (4.16 per cent) from 1930 to 1933. Since these districts include some of the smaller communities, the increase bears out the above mentioned trends for such places. For the strictly rural sections, such a decided change was not in evidence in 1930.

The counties whose entire population is classified as

* Second-class school districts have between 30,000 and 500,000 population; third-class 5,000 to 30,000; fourth-class less than 5,000.

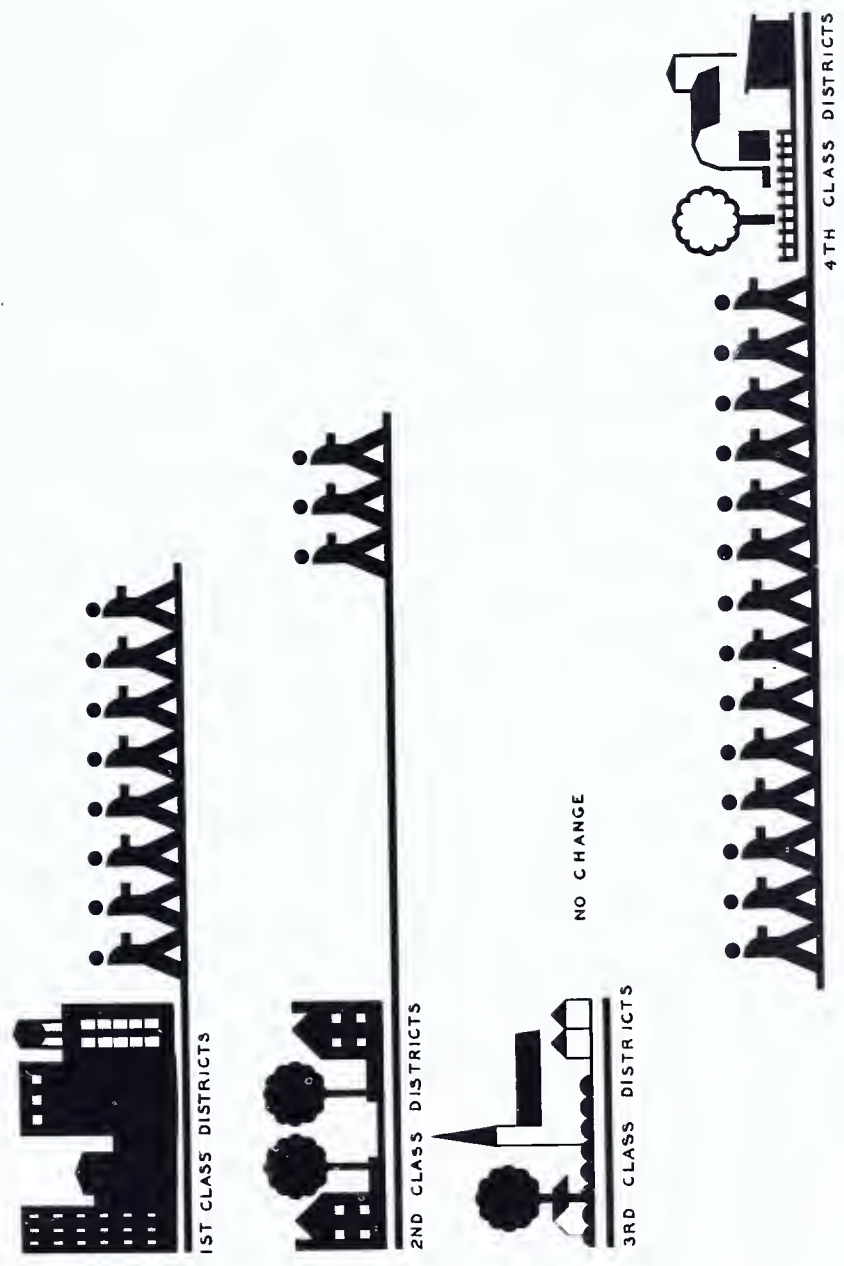
POPULATION OF PENNSYLVANIA
CITIES AND BOROUGHES HAVING 25,000
OR MORE POPULATION IN 1930

	1930	1934	1930-1934
	U.S. Census*	Unemployment Census**	Percentage Change
Aliquippa	27,116	25,332	-6.6
Allentown	92,563	91,132	-1.5
Altoona	82,054	78,645	-4.1
Bethlehem	57,892	57,279	-1.1
Chester	59,164	54,713	-7.5
Easton	34,468	32,344	-6.2
Erie	115,967	105,818	-8.8
Harrisburg	80,339	79,620	-0.9
Hazleton	36,765	36,392	-1.0
Johnstown	66,993	61,785	-7.8
Lancaster	59,949	58,224	-2.9
Lebanon	25,561	23,518	-8.0
McKeesport	54,632	53,152	-2.8
Nanticoke	26,043	25,437	-2.3
New Castle	48,674	46,500	-4.5
Norristown	35,853	31,071	-13.3
Philadelphia	1,950,961	1,862,032***	-4.6
Pittsburgh	669,817	643,505***	-3.9
Reading	111,171	105,977	-4.7
Scranton	143,433	138,207	-3.6
Sharon	25,908	25,446	-1.8
Wilkes-Barre	86,626	80,292	-7.3
Wilkesburg	29,639	28,450	-4.0
Williamsport	45,729	41,996	-8.2
York	55,254	53,733	-2.8

* Census taken April 1930

** Census taken April 1934

*** Census taken February 1934



POPULATION CHANGE
BY SCHOOL DISTRICTS 1930 TO 1933

EACH FIGURE = 10 000 PERSONS



PLANNING
BOARD

FIGURE NO. 14

fourth-class school districts, gained substantially with one exception. Sullivan County lost 1.15 per cent--a downward trend which has been evidenced since 1900. On the other extreme, Perry County which also declined from 1900 to 1930, changed completely to gain 20.53 per cent--the largest percentage change registered for the 1930-1933 period. Of the other counties losing by 1930, only Somerset continued in that direction in the three years following.

The reason for the general change in trend in these counties lies in the fact that so much of their territory had been abandoned farm land. In these sections people discovered unoccupied buildings and small farms which could be rented cheaply. A study of the third and fourth class school districts in four counties having a low value of agricultural crops, shows that they gained more proportionally than the same number of counties where the value of the agricultural crops was high.

From past experience it is fair to assume that when the economic situation improves it will be the poorer land from which the people will move first. The movement therefore to the areas just mentioned is not a permanent trend.

With two exceptions, the same may be said of those counties which lost from 1930 to 1933. The exceptions, Somerset and Sullivan Counties, which have been losing since 1920, are likely to continue to do so. On the whole the decline from 1930 to 1933 is found in the regions in which the urban popu-

lation is predominant.

In the southeastern area, Philadelphia lost, but the counties bordering the city increased substantially. This is further proof that the suburban movement indicated in 1930 has progressed rapidly since then. With economic recovery, Philadelphia may regain its loss but the outlying districts will continue to be densely populated centers.

In the southwestern section Allegheny, Washington, Westmoreland and Fayette Counties showed slight losses, caused principally by the temporary stagnation in the coal and steel industries.* The inactivity of the steel industry accounts likewise for the losses in Lawrence and Mercer Counties.

Lackawanna, Luzerne, Carbon, Lehigh and Northampton Counties in the third urban area, show losses caused by the slack production of coal and steel also.** So each of these urban districts, depending largely upon manufacturing concerns, have felt the effects of emigration resulting from curtailment on the part of industry. When these companies again start their factories, labor will return to these sections. So the drift from these counties like the drift to the poorer counties is not a permanent shift.

* A study of five counties (the four just mentioned plus Greene) showing a high value of bituminous products also bears out the small loss in spite of the fact that Greene County gained considerably.

** A study of five counties having the highest value of anthracite products (Carbon, Lackawanna, Luzerne, Northumberland and Schuylkill) reveals a loss despite the fact that the latter two counties gained.

The State as a whole increased in the 1930-1933 period but at a much slower rate than it did from 1920 to 1930. It is probable that the total increase did not exceed 32,000. This is very small in view of the excess of births over deaths by 204,000. This further indicates that many people have left the Commonwealth.

Births and deaths have continued their downward trend. The deaths from all causes dropped from 111,606 in 1930 to 106,163 in 1933, while the births showed an even greater decrease for the same period. In 1930 there were 189,458 live births in Pennsylvania--in 1933 there were 157,059. In cities over 25,000 population, with the exception of Nanticoke, Wilkes-Barre and York, the births decreased in 1933 from 1930 and in all but seven of the cities in this group the deaths also declined.

While the number of marriages performed in the Commonwealth decreased in 1930, 1931, and 1932, the total increased in 1933 by 7,374 over 1932. In the past, years which witnessed large marriage totals were followed by years of increased natality. The eight months' figure available for 1934 when compared with that of the corresponding period in 1933 shows such a small variation that 1934 may possibly have as many if not more births than the previous year. However, the general downward trend of the birth rate will not be affected.

When comparing the deaths for the same months in 1933 and 1934 it is discovered that the deaths in the latter year

are more numerous indicating that 1934 death totals will be higher than those of the preceding year.

FUTURE POPULATION

Pennsylvania gained 0.32 per cent in population from 1930 to 1933, estimated on the basis of school census.* If this continues, the increase for 1930-1940 would be 1.07 per cent as compared with 10.5 per cent from 1920-1930. This is an unusually large drop but it parallels that predicted for the United States for 1930-1940.** The sharp downward trend probably will continue as indicated for the decade unless marked industrial recovery occurs within the next five years, which would cause migration into the State. Then the rate of increase for the Commonwealth for 1930-1940 might be raised somewhat.

-
- * The use of school census as a basis for population estimates assumes that there is the same proportion of school children in the entire population for each year, which is not the case due to the variation in the birth rate. Ordinarily the margin of error is not great.
 - ** In 1933 Dr. Warren S. Thompson and Dr. P. K. Whelpton calculated the future population of the United States upon three different sets of assumptions. In each instance the rate of decennial increase dropped noticeably--from 16.1 per cent between 1920 and 1930 to 10, 8.4 or 7.4 from 1930 to 1940, depending upon the birth and death rates and migration used for the calculation. According to their high estimate the United States would increase from 122,775,000 in 1930 to 167,300,000 in 1960. Their medium estimate gives 149,800,000 in 1960, while their low estimate gives 137,900,000 for that year (Population Trends in the United States; Thompson and Whelpton). In a later statement Dr. Whelpton asserts that "unless the decline in births and in the specific birth rates is checked rapidly the low figure of 136,500,000 (estimated for 1956) as a maximum population for the United States will not even be reached" (The Population Prospect: Whelpton).

Beyond 1940 it would be unwise to estimate population according to this accelerated trend because it appears to be only temporary. It reflects the unusual effects of the depression. As economic activity or inactivity causes drifts from rural to urban and vice versa, it is possible that these factors cause shifts to industrial states and away from them. It is reasonable to suppose then that business recovery might retard the large migration from Pennsylvania although it would not check it completely. For comparison, the population on the school census basis has been estimated and charted for the years following 1940, using the 1930-1940 rate of increase.

Dr. Warren S. Thompson of the Scripps Foundation for Research in Population Problems, has compiled two estimates of Pennsylvania's future population by five-year periods from 1930 to 1960 based upon two general assumptions--first, no migration either into the State or within the State, and second, with interstate migration and with the same movement within the State as occurred between 1920 and 1930. In addition he assumed that the birth rate would fall until in 1960 it would be about two-thirds of the 1930 rate, that the expectation of life would increase approximately five years during the same period, and that there would be no foreign immigration. Each set of estimates was compiled for urban, rural-farm and rural non-farm.

The estimates on the basis of no migration show the urban population continuing to grow steadily until 1950 and then de-

clining so that the 1960 total would be less than that of 1940. The rural non-farm would steadily increase while the rural-farm would gain gradually from 1930 to 1935, then fairly rapidly until 1950 and again slowly for the next ten years.

For the State as a whole this estimate gives a steadily increasing population from 1930 to 1960. For 1935 the figure is 9,912,500 as compared with 9,682,685 on the basis of school census. By 1960 a total of 10,808,300 is reached.

Assuming interstate migration, Dr. Thompson estimates that the urban population will grow steadily from 1930 to 1945 but not as rapidly as it did prior to 1930. From 1945 it would increase even more slowly until in 1955 it reaches the peak. After that there would be a gradual loss. The rural non-farm would change little, gaining about 5.8 per cent in 30 years. The rural-farm would continue to lose, not quite so rapidly as it did between 1920 and 1930, but nevertheless would change much faster than the urban or rural non-farm divisions.

When combined for the State, these estimates show the population increasing slowly but at a rate greatly reduced from the 1920-1930 one. After 1940 the gains are estimated to be still smaller until in 1955 when the maximum of 10,410,500 is reached. By 1960 the total would drop to 10,410,200, indicating that the decline would be much slower than the gain. These estimates are set forth in an accompanying table.

Of the two sets of estimates computed by Dr. Thompson, the second seems preferable. As has been pointed out, prior to 1930,

Pennsylvania was greatly affected by interstate migration and since that time, it has played no less a part in determining the location of the State's population. The estimate which includes such an important factor would appear to be more accurate. The suburban movement which was in evidence in 1930 indicated a continued growth in the urban and rural non-farm divisions of the State. It was predicted that the large urban centers would increase less rapidly and the future urban growth would be found in the smaller communities adjacent to the large cities. A steady rural non-farm growth was indicated. The strictly rural counties which were not gaining in 1930 were likely to continue in the same direction while the rural sections in the vicinity of large cities were likely to gain as they had prior to 1930. All of these movements appear to be included in this estimate.

The data concerning the reversal of trends since 1930, especially those affecting the larger cities and the rural sections, were not available when Dr. Thompson's study was made. While it is true that they probably are temporary, they have been so far-reaching that they will noticeably "slow up" the future increases for the State. The losses in the urban sections during 1930 to 1934, even if they did not continue any longer, would cause the urban growth of the next few years to be retarded. The unusual increases in the rural sections in the last four years would moderate the downward trend in those areas. Migration from the State recently has been greater than

in past years. The number of births has fallen rapidly but the deaths have decreased more slowly.

For these reasons it is believed that the future population of Pennsylvania lies between the estimate based upon school census and that of Dr. Thompson, assuming interstate migration, although it probably will be nearer the latter figures. Pennsylvania's maximum population will be reached probably between 1955 and 1960, with slightly more than 10,000,000 persons.

If all the trends continue as indicated and if these estimates are sound, Pennsylvania may expect:

1. To gain approximately 700,000 in the next 20 years, as compared with 1,966,000 in the last two decades, showing that the slowing up in the rate of increase for the State will continue.
2. The birth rate to decline about one-third by 1960; death rate to decline slowly for a shorter period and then rise as the population grows older.
3. To continue to lose more than it gains by interstate migration.
4. Fewer children and more adults especially in the older age groups, actually and proportionately, than heretofore.
5. A more uniform population due to the decline in the number of foreign-born.
6. The larger cities not to gain as rapidly as the areas around them, the rural non-farm to gain steadily while

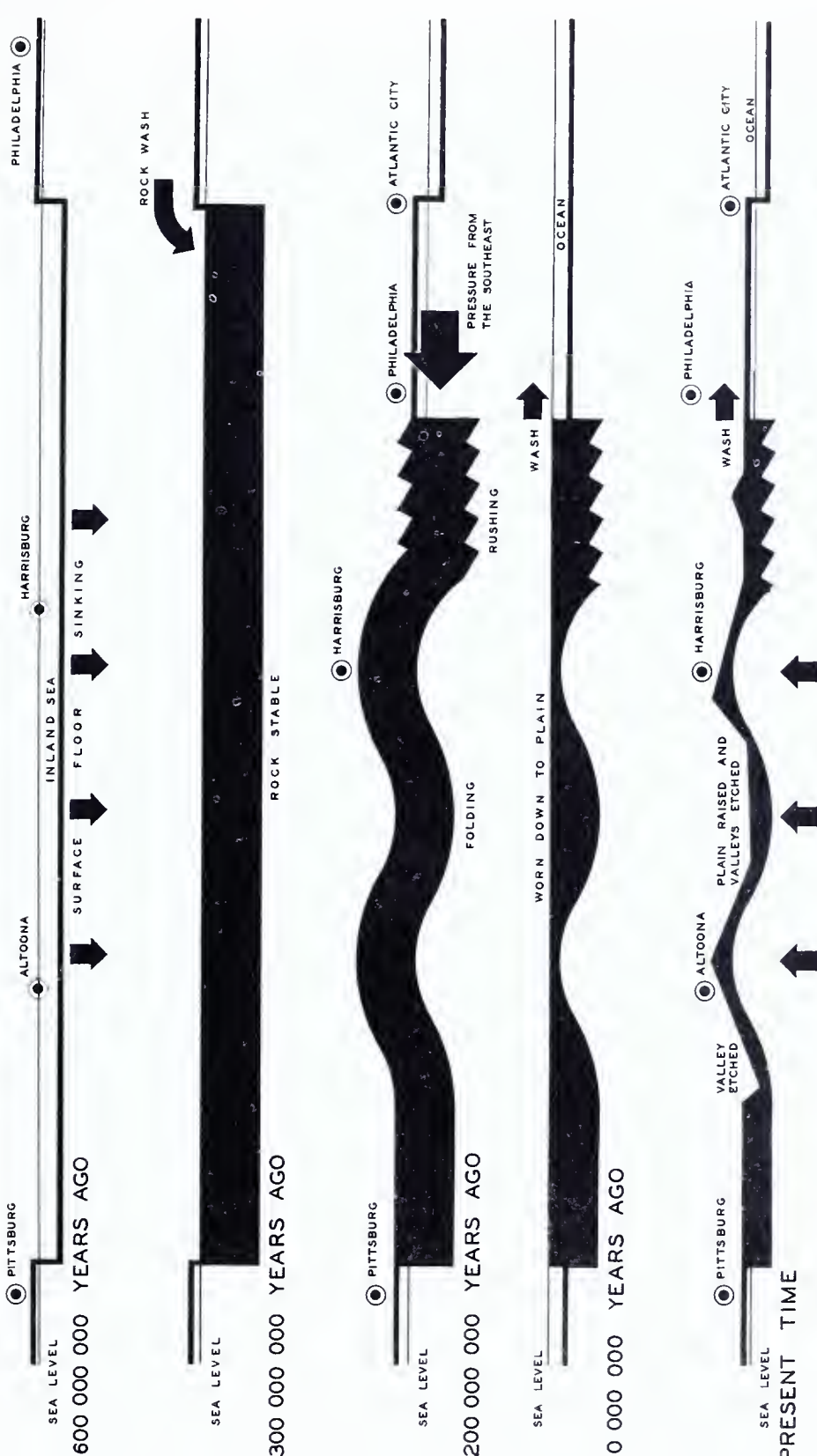
the poorer farm land continues to lose.

All of these are factors which will affect the educational, industrial and social activities of Pennsylvania and must be considered in long-term planning.

POPULATION ESTIMATES*
1935-1960

	Estimate Based on	Thompson's Estimate Based on	
	School Census	No Migration	Interstate Migration
1935	9,682.6	9,912.5	9,861.3
1940	9,734.0	10,173.5	10,057.4
1945	9,785.9	10,416.9	10,224.2
1950	9,837.7	10,620.6	10,348.6
1955	9,890.2	10,751.8	10,410.5
1960	9,942.6	10,808.3	10,410.2

* In thousands.



PRINCIPAL EVENTS IN GEOLOGIC
DEVELOPMENT OF PENNSYLVANIA

FIGURE NO. 15

PHYSIOGRAPHY OF PENNSYLVANIA

LAND SURFACE REGIONS.

I. POSITION, FORM AND SIZE.

A. Position

Pennsylvania's position is near the northeastern corner of the United States between $39^{\circ}-43'-26''$ and 42° North Latitude. Pennsylvania is called the "Keystone" state because it held the center position in the original thirteen states. At present it belongs to the Middle Atlantic States which includes two adjoining states, New Jersey and New York.

B. Form

Pennsylvania is nearly rectangular in shape. The northern, southern and western boundaries are regular. In the northwest corner is a small triangle that extends forward to Lake Erie. This small section was bought from the United States government to give the State an outlet to the Great Lakes. The eastern boundary, formed by the Delaware River, is irregular, and the boundary between Pennsylvania and Delaware forms the arc of a circle.

C. Size

The area of the State is 45,126 square miles or a total of 28,880,640 acres. The land surface area is 44,832 square miles, and the water surface 294. New York is larger than Pennsylvania by 5,000 square miles,

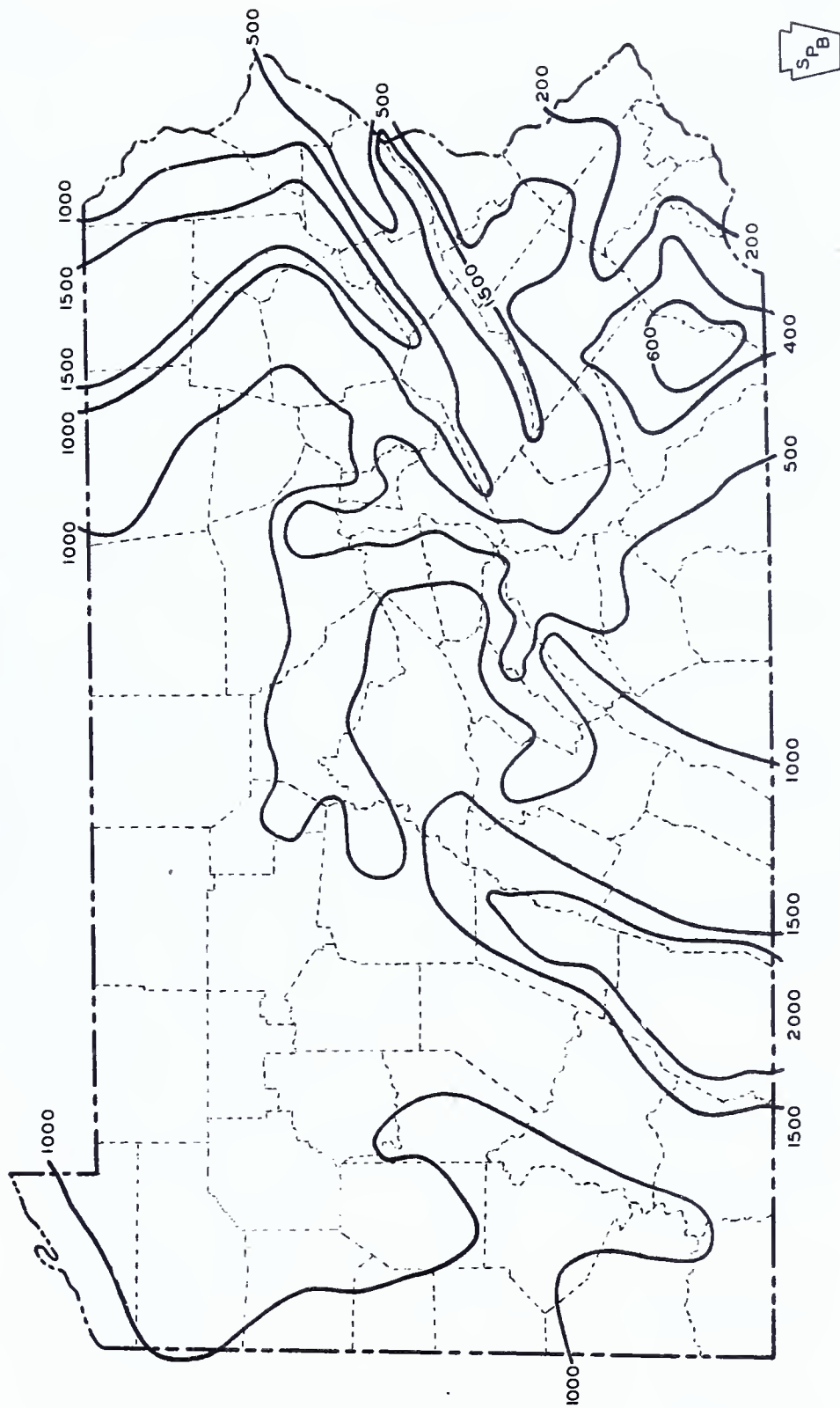
but Pennsylvania is more than twice as large as New Jersey, Maryland and Delaware put together.

II. ORIGIN OF PENNSYLVANIA RELIEF.

It is estimated that 600 million years ago, Pennsylvania was part of an inland sea. Into the sea were being washed mud, gravels, sands and limy materials mainly from the south-east. The sea bottom rose and sank, but in the main, sinking dominated and finally reached so great a depth that 30,000 feet of rock material has accumulated in southeastern Pennsylvania, but thinning to half of that or less in north-western Pennsylvania. The great weight of the overlying layers, and the action of water changed the sediments to rock, sands to sandstone, gravels to conglomerate, mud to shale, and limy deposits to limestone. At the end of the carboniferous age of coal, this great mass of rocks was subjected to a great pressure from the southeast. Some of the rocks were heaved into great folds or crushed. In the eastern part of the State, the rocks were pushed westward, shortening the underlying rock by one or two hundred miles.

The great rock folds were believed to have reached a height comparable with the Alps or Andes of today. Then followed several million years of erosion, during which time the mountains were wearing down to a plane but little above sea level. The final stage in the formation of Pennsylvania's relief features has been brought about by a succession of broad uplifts with long stops between the several

TOPOGRAPHIC MAP



uplifts, and the gradual wearing down of the softer rocks into valleys and the harder rocks forming the ridges.

The level top of the ridges and plateaus tell of a time long ago when they were part of a plain lying but little above sea level. Erosion is taking place constantly by water passing over the land surface and although not so noticeable, the action of water, heat and cold on the land surface is gradually breaking up the mountain ridges, each year bringing the land surface as a whole nearer the level of the sea.

III. PHYSIOGRAPHIC OR LAND SURFACE REGIONS

Pennsylvania is divided into three large and two small

Physiographic Regions:-

- a. The Piedmont Plateau
- b. The Ridge and Valley Region
- c. The Allegheny Plateau, which is part of the Appalachian Plateau
- d. The Pennsylvania part of the Atlantic Coastal Plain
- e. The Lake Erie Plain. Each of the three major regions have their area divided into sections which are discussed separately.

A. PIEDMONT PLATEAU

The Piedmont Plateau occupies the southeastern part of the State and includes about one-ninth of the entire area. It takes in all the land from the Coastal Plain to the Ridge and Valley Regions.

This broad undulating Plateau rises gradually from the Coastal Plain to the base of South Mountain. Above the level of its comparatively smooth surface rise numer-

ous hills and low ridges of swelling outline. While the Plateau rises northward there is a gradual ascent south-westward. (See Contour Map.)

The Plateau is divided into three sections: Lowland and Hill Section; Limestone Valleys and Piedmont Highlands.

a. Lowland and Hill Section

This section has many rounded hills and shallow valleys with occasional knobs and low ridges. The rock structure that forms this region is red shale, sandstone and traprock. Much of the soil is thin and not productive.

b. Limestone Valleys Section

This area is a broad lowland, gently rolling, with a few low hills. The valleys are underlaid with limestone which has weathered into soil rich in plant food. Most of this section is located in Lancaster County which has some of the richest farm lands in the United States.

c. Piedmont Highlands Section.

The greater part of this area is rolling into hilly with steep slopes along the streams. The valleys dissected by streams are, for the most part, narrow.

The Piedmont Plateau is one of the most favored regions in the State. It is traversed by

PHYSIOGRAPHIC SUB - REGIONS

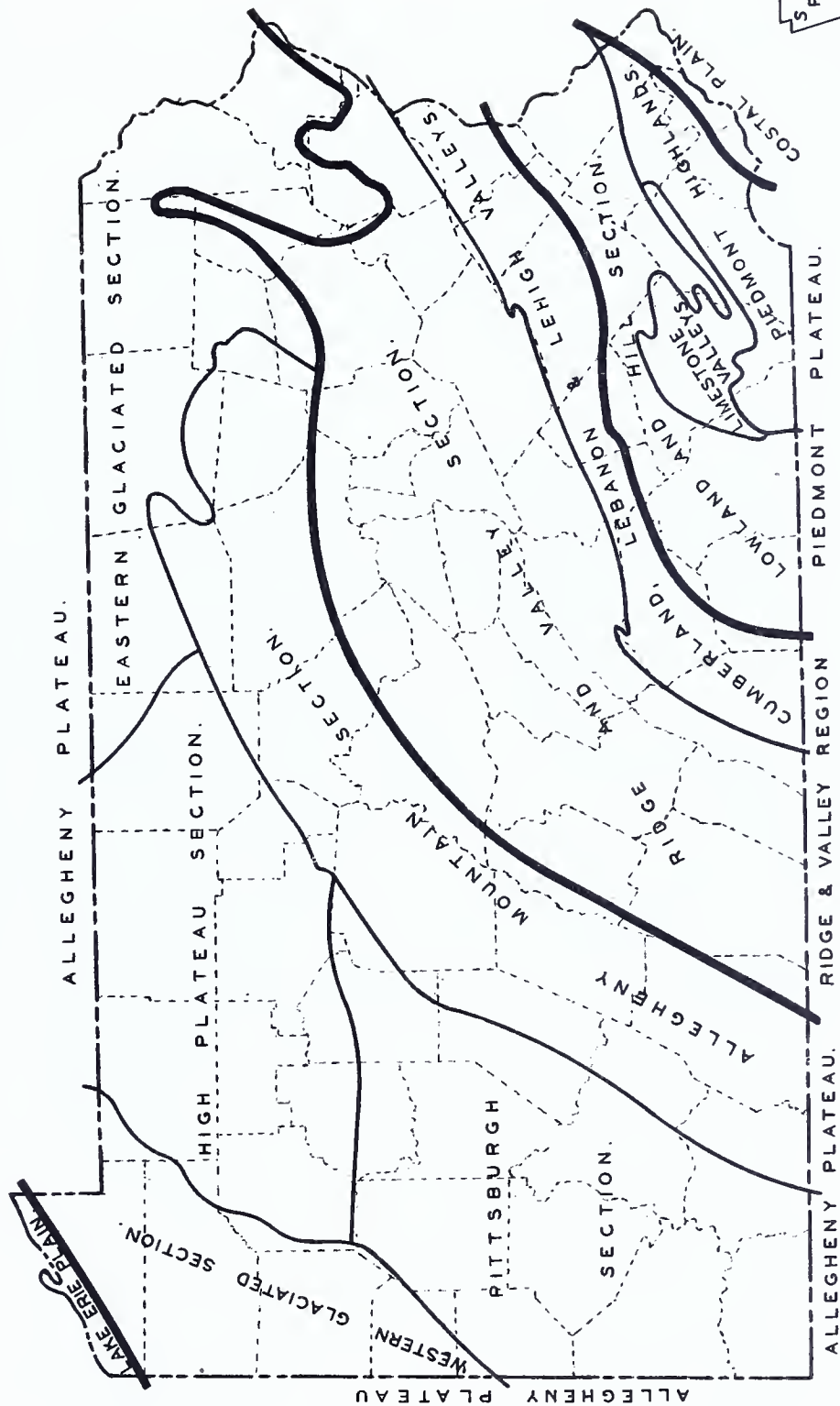


FIGURE NO. 17

the Delaware, Susquehanna and Schuylkill Rivers and many tributaries.

The climate is temperate and well suited for human activity. The fertile soil produces abundant crops and the large municipalities within its bounds are a ready market for all its products.

B. RIDGE AND VALLEY REGION

This section includes the Pennsylvania section of the Great Valley or Lehigh, Lebanon and Cumberland Valleys and Pennsylvania's sections of the Appalachian Mountains known as the Ridge and Valley Belt. About one-fourth of the State area is included in this region.

a. Lehigh, Lebanon and Cumberland Valley Section.

Bounded on the south by the South Mountains, and on the north by the Kittatinny or Blue Mountain lies a broad area varying in breadth from ten to twenty miles and extending across the southeastern part of the State from Northampton County on the east to Franklin County in the South. The southern section is called Cumberland Valley, the central Lebanon Valley and the eastern Lehigh Valley. The valley has the character of an undulating or rolling plain. At present the Valley is a well cleared highly cultivated district. Its northern side is somewhat hilly and broken, but its middle and southern belts are smooth, fertile and well tilled.

Most of the Valley land is susceptible of cultivation and is underlaid with limestone which has disintegrated into a loamy soil high in lime content. Though certain parts of the valley near the northern boundary of Lehigh, Berks and Lebanon Counties are somewhat hilly and broken, it is nowhere interrupted by rugged and lofty ridges.

b. Ridge and Valley Section

This section extends from the Blue Mountains to the Allegheny Mountain or escarpment of the Allegheny Plateau and is from thirty to fifty miles wide. The chain of ridges in this section is long and narrow, running parallel to each other and separated by a few broad and many narrow valleys.

The ridges sometimes end quite abruptly in the form of knobs, while others taper off into the valleys in long slender points. The slopes of these mountains are generally uniform and are not broken by ravines or gullies for many miles. The ridges vary in height from 1300 to 1600 feet above sea level along Blue Mountain. Many of the mountains, however, do not reach these heights. Several of the valleys between the mountains are broad and flat, while others have small ridges and hills. The scenery when viewed from the crest of some of the higher ridges is quite picturesque. As

far as the eye can see there is ridge after ridge covered with timber. Looking northeast or southwest there is a picture of long receding valleys dotted with farms, patches of woodland and streams.

This whole mountain chain is the result of the elevation of the rock strata into great folds of long slender parallel waves and the erosion or wearing away of the softer rock material between the folds by streams. Some of these mountains are arranged in groups with long, narrow crests in a straight line for great distances, while others bend in a general curve to the northeast and southwest. In many instances the crests of ridges come together at their extremities and inclose a narrow oval valley resembling the shape of a canoe. Interspersed among the narrower ridges are tracts of land, broad and flat, and at the same height as the narrow crested mountains. These areas have many large rocks and are covered by scrub growths. There are many water gaps where the rivers have cut through the mountains. These are seen by studying the Relief map.

The general direction of travel through this section is northeast and southwest except where the

rivers have cut through the ridges, thence the direction is north and south.

The relief of the Ridge and Valley Section is characterized by three classes of features: the river channels with their associated level bottom; the upland or general level of the valley which is more or less cut into rounded hills of nearly equal elevation; and the ridges which also in a general way rise to a uniform altitude.

The two classes of rocks which form this section are quartz rocks and limerocks. There are many varieties differing in composition, color and texture; but they all fall into the two great classes of the quartz rocks and the lime rocks. The soluble lime rocks occur in the lower slopes of the ridges and valleys. The insoluble quartz rocks forms the crests of the ridges.

C. ALLEGHENY PLATEAU REGION

The Allegheny Plateau, a part of the Appalachian Plateau, covers about two-thirds of the state and includes the entire area north and west of the Ridge and Valley Section except the Lake Erie Plain.

The Allegheny Plateau is divided into five sections:

- a. Allegheny Mountain Section
- b. Eastern Glaciated Section
- c. High Plateau Section
- d. Western Glaciated Section
- e. Pittsburgh Section

a. Allegheny Mountain Section

This section of the plateau is mountainous in character. Entering Pennsylvania from the south and passing through Somerset and Fayette Counties are three parallel ranges. Through Somerset County on the east passes Allegheny Mountain; on the border of Somerset and Fayette Counties is the Laurel Ridge, and a short distance westward, Chestnut Ridge. These mountains are the highest in the state. Mt. Negro in Somerset County reaches a height of 3200 feet. There are other places in this area that exceed 3000 feet and most of the highland between the mountains is above 2500 feet. As these mountain ranges extend northward, their elevations gradually become smaller. In Clearfield County, Chestnut Ridge loses its mountainous character and is replaced by a broad upland running across the northern part of the county.

The Allegheny Mountain likewise breaks down in eastern Centre, Clinton and Lycoming Counties into smaller ranges with many wide valleys. In the northeastern part of this section, in Sullivan and Wyoming Counties, the mountains again rise to nearly 2600 feet and have

many narrow valleys.

The ridges and hills between them have rounded summits and comparatively gentle slopes except where the streams have cut deep into the hillsides. The mountains and hills are covered with second growth timber, while the broad valleys, being fertile, have many productive farms.

b. Eastern Glaciated Section.

The eastern glaciated section is bolder in relief and has greater number of lakes than the western glaciated section. The Pocono Plateau in this section is about 1900 to 2200 feet above sea level and covers a broad area underlaid by nearly horizontal rock layers.

The eastern portion of this section has many rounded hill tops and water falls where the streams leave the plateau entering the valleys below. The northern part has many deep valleys, some having broad bottom lands.

The North Branch of the Susquehanna flows through this section and has cut many gaps through the low hills.

There are numerous lakes especially in Susquehanna, Wayne and Pike Counties which were formed for the most part by the blocking-up of the valleys and ravines by the glacial drift, thus

closing the outlets of the streams.

This rolling and hilly surface with its many valleys, lakes, waterfalls and forests has become a retreat for hundreds of vacationers seeking recreation and cool highlands surrounding the many lakes.

c. High Plateau Section.

This section of the Allegheny Plateau region has broad highlands and many deep cut narrow valleys from 300 to 1400 feet deep. The eastern half of this northern plateau has several long parallel mountains, having the structure of an elevated flat basin. While the general surface of the main table-land and its mountain spurs is comparatively level, the hill slopes are extremely steep.

The hilltop surface gradually increases in elevation from the Pittsburgh section to an elevation of 2000 feet or more in Warren, McKean and Potter Counties. The greater part of this region is covered with timber and sparsely inhabited. Agriculture is carried on a small scale, since the soil is not very productive and the growing season is shorter than in the southern counties.

d. Western Glaciated Section.

This section which is covered with a thin sheet of glacial drift rises from 1100 to 1300 feet along the Ohio border to 2000 feet in Warren County. It is a gentle undulating or rolling region with many broad divides, moderately deep ravines, lakes and many swamps. There are many interconnecting valleys which at present do not have streams running through them. The surface is most rugged near the Allegheny River, and the valleys are cut quite deep.

e. Pittsburgh Section

The area west of Chestnut Ridge and south of the high plateaus and glaciated section has been cut by many streams. The valleys are V shaped, and the hills all rise to about the same elevation. The hills are lowest in the southwestern part of the state. Through Pittsburgh and extending northwest and southeast, the elevations are from 1200 to 1400 feet above sea level. From this level the elevation gradually rises to 1600 feet in the southwest corner of the state and northeastward from Pittsburgh rise with uniformity to 1600 feet above sea level southwestern Venango, Clarion and Indiana Counties.

The rock strata is harder in the northern part of this section which has produced broader

ridges and narrow valleys than those farther south. From the hilltops the horizon has the appearance of a flat plain similar to the prairie regions in the Central States. The great bituminous coal deposits, oil and natural gas fields are located in this section.

D. COASTAL PLAIN

In the southeastern corner of the state along the Delaware River in Bucks, Philadelphia and Delaware Counties is a narrow strip of land known as the Coastal Plain. It is flat lowland close to sea level. The soils are largely sandy loams. The western boundary of this section is marked by the Piedmont Highlands, where the river flows from the narrow valleys or the eastern edge of the highlands out into the lower level of the Coastal Plain.

E. LAKE ERIE SECTION

This narrow section lies between the watershed of the Ohio and the shore of Lake Erie. It descends rather rapidly from the watershed to the lake by a succession of rather steep slopes. The elevation of the watershed to the south is nearly 1200 feet and at the lake about 600 feet above sea level. There are numerous ravines and narrow and steep valleys carrying its waters to the lake. A cross section southward from the lake has the appearance of a series of broad steps. On the

Lake shore there are cliffs from 80 to 100 feet high, then a broad flat a mile or more wide, then a rise of 20 to 40 feet, followed by another flat which ends in a sharp rise. In western Erie County there are three such flat areas, each representing an old lake bottom and shore line. Lake Erie at one time was much larger than it is now and land along the shore shows unmistakable signs of having been lake bottom.

DRAINAGE

Pennsylvania is divided hydrographically into six drainage basins.

1. Delaware Basin
 2. Susquehanna Basin
 3. Potomac Basin
 4. Genesee Basin
 5. Erie Basin
 6. Ohio Basin
- Sec. Fig. Drainage basins.

The State has three important river systems: The Delaware in the east, the Susquehanna in the middle, and the Ohio in the west; while smaller areas drain into the Potomac River in the middle south, into Lake Erie in the northwest, and into Lake Ontario through the Genesee River, in the middle north section.

Precipitation in Pennsylvania finds its way into the Atlantic Ocean by the Delaware, Susquehanna and Potomac Rivers, through Delaware and Chesapeake Bays; by the Allegheny and Monongahela into the Ohio and thence into the Mississippi River and Gulf of Mexico; other streams discharge into Lake Erie and Lake Ontario and flow through the St. Lawrence River and Gulf of St. Lawrence into the Atlantic Ocean.

In an area of less than one square mile near the center of Potter County, rivulets find their origin, leading eventually to the waters of the Gulf of St. Lawrence by way of the Genesee River, to Chesapeake Bay by way of the Susquehanna River and to the Gulf of Mexico by way of the Allegheny River.

1. DELAWARE BASIN

The Delaware Basin occupies the eastern portion of the State and includes all the area in Pennsylvania draining into the Dela-

ware River.

The principal streams draining this basin are: Delaware River, Lackawaxen River, Lehigh River and Schuylkill River.

a. Delaware River

The east and west branches have their headwaters in the Catskill Mountains of eastern New York, at an elevation of about 1900 feet and unite at Hancock, New York, on the Pennsylvania - New York boundary, to form the main stream at an elevation of 895 feet.

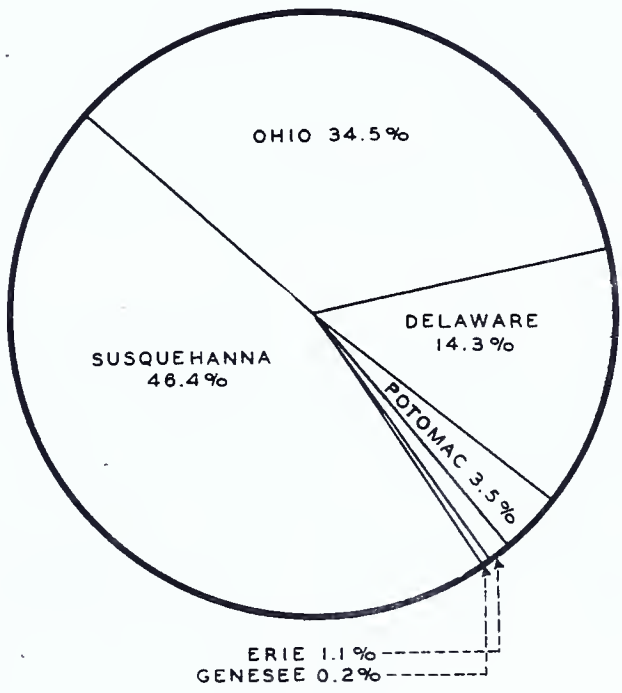
The course of the stream is irregular. The topography is mountainous in the northern part of the basin which lies within the glaciated area, abounding in lakes and ponds. Along the eastern boundary of Wayne and Pike counties the precipitous slopes of this high table land finally emerge into a broad, open valley. The river cuts through the Kittatinny Range at Delaware Water Gap and continues across the plain to South Mountain below Easton. At Trenton the river is bordered by hills and valleys and drains the low, gently rolling land of the Piedmont Plateau.

The river channel is generally swift and shallow, flowing over bed rock with numerous riffles separating pools. At Trenton an eight foot fall occurs which limits the tidal effect extending to this point; the river has been improved for navigation from this point southward.

The total length of the Delaware is 375 miles. In Pennsylvania the West Branch flows a distance of seven miles

PRIMARY DRAINAGE BASINS

PROPORTIONAL PART OF PENNSYLVANIA OCCUPIED BY EACH



BASIN	AREA (IN PENNA) IN SQUARE MILES
DELAWARE	6,460
SUSQUEHANNA	20,917
POTOMAC	1,570
GENESEE	96
ERIE	512
OHIO	15,571
TOTAL	45,126



FIGURE NO. 18

along the New York - Pennsylvania boundary and then connects with the East branch forming the main stream which has a length of 248 miles.

The total drainage area is 12,912 square miles. In New York, 2,650 square miles; in New Jersey, 2,345 square miles; in Pennsylvania, 6,460 square miles embracing all of 8 counties and portions of 9 counties in the eastern end of the State.

b. Lackawaxen River

This stream flows through broken, mountainous country containing numerous small lakes, ponds and swamps in portions of Wayne, Lackawanna, Monroe and Pike counties and enters the Delaware River at Lackawaxen.

The length of the stream is twenty-seven miles and has a drainage area of 602.8 square miles. The river channel is over a rocky bed, between steep banks, and has a deep gorge with cascades in its lower course.

c. Lehigh River

The Lehigh River has its source in southwestern Wayne County and drains an area of 1,373 square miles, embracing portions of Wayne, Lackawanna, Monroe, Luzerne, Carbon, Schuylkill, Berks, Northampton and Lehigh counties. The length of the river is 100 miles and enters the Delaware at Easton.

The basin above Lehigh Gap lies within the Ridge and Valley Region with its parallel ridges and narrow

valleys. Below Blue Mountain the basin lies in a broad rolling agricultural section.

The river channel has high and rocky banks, especially in its upper course; between White Haven and Mauch Chunk it is like a gorge. The waste from coal mines deposit great quantities of culm in the river.

d. Schuylkill River

The source of the Schuylkill River is in Schuylkill County at an elevation of 1,160 feet. The course of the river is southeasterly a distance of 131 miles. The mouth is at League Island, Navy Yard below Philadelphia.

The drainage area contains 1,915 square miles, embracing portions of Schuylkill, Carbon, Lehigh, Berks, Lebanon, Chester, Montgomery, Bucks, Delaware and Philadelphia Counties. The area drained in Schuylkill County is mountainous; at Hamburg the river enters the Great Valley and passes through Reading and South Mountain, below which lies a broad, rich, rolling agricultural plain.

2. SUSQUEHANNA RIVER BASIN

The Susquehanna River Basin is the largest drainage basin in Pennsylvania. The water-shed lies in four physiographic divisions, Allegheny Plateau, 15,400 square miles; Ridge and Valley section, 8,500 square miles; Great Valley, 1,700 square miles; Piedmont Plateau, 1,800 square

miles.

The Susquehanna basin has a total area of 27,400 square miles. It comprises 20,917 square miles in Pennsylvania or over 46 per cent of the State area; 6,270 square miles in New York; and 213 square miles in Maryland.

The principal streams in the Susquehanna basin are: Susquehanna River and its North and West branches; Juniata River and its Raystown and Frankstown branches. Each of these streams have many tributaries of local importance.

a. Susquehanna River

The Susquehanna River is formed by the junction of its North and West branches at Northumberland, Northumberland County. Below this point the river drains an area of 9,320 square miles. It flows nearly south between Northumberland, Dauphin and Lancaster counties on the east and Snyder, Juniata, Perry, Cumberland and York counties on the west, passing then into Maryland and entering into Chesapeake Bay at its northern extremity, a total distance of 128 miles, in Pennsylvania 112 miles. Between Northumberland and Harrisburg the river cuts through a series of parallel mountain ridges forming many water gaps. The river from Northumberland to a point about 12 miles below Columbia is wide and shallow, averaging about a mile in width and contains many rocky islands. About 23 miles above the Pennsylvania - Maryland boundary the stream enters

a gorge where it becomes narrow and rapid and on either shore is for the most part flanked by rocky bluffs.

The main tributaries below Northumberland are:
Penns Creek, Juniata River, Conodoguinet Creek, Swatara Creek, and Conewago Creek.

(1). North Branch, Susquehanna River

The North Branch of the Susquehanna has its source in Otsego Lake, Catskill Mountains, southeastern New York. It drains a total area of 11,277 square miles; in Pennsylvania, 5,007 square miles, embracing portions of Potter, Tioga, Bradford, Carbon, Susquehanna, Wayne, Lackawanna, Wyoming, Sullivan, Lycoming, Columbia, Luzerne, Schuylkill, Montour and Northumberland counties. The total length of the North Branch is 316 miles, in Pennsylvania 165 miles. The river drains a rolling broken country in New York. In Pennsylvania, it drains a mountainous region and is confined to a narrow valley between ridges. The northern part abounds in lakes and ponds of glacial origin. The North Branch drains the great Lackawanna and Wyoming coal basin which extends from Nanticoke on the southwest to Carbondale on the northeast. The river channel is tortuous in many places, through gravel, sand and boulders, between high banks and containing many islands. The stream is polluted

with coal waste forming deposits of culm in the channel.

The main tributaries of the North Branch are: Chemung River, Tioga River, Tunkhannock Creek, Lackawanna River, and Fishing Creek.

(2). West Branch, Susquehanna River

The West Branch of the Susquehanna rises in Cambria County at an elevation of 1,990 feet and drains an area of 6,913 square miles, embracing portions of Cambria, Clearfield, Center, Elk, Cameron, Potter, Clinton, Columbia, Tioga, Indiana, Jefferson, Lycoming, Bradford, McKean, Sullivan, Montour, Northumberland, Union and Wyoming counties. The total length of the river is 228 miles, and drops to an elevation of 430 feet at Northumberland. The West Branch drains the high tablelands of the plateau region and has formed deep trenches in the horizontal strata. From Clearfield to Lock Haven the country is rough and rugged, with much of the country covered with timber. From Lock Haven to its mouth it drains many agricultural valleys, and mountains. The channel is tortuous in its upper course, having gravel and sand beds with rocky ledges in many places, and then becomes narrow, flanked with high steep hills and with very little bottom land. From Lock Haven to Muncy the river

winds through a wide cultivated valley, flanked with steep wooded ridges, and southwest of Muncy the river crosses a belt of deeply eroded country, full of conical hills.

The main tributaries to the West Branch are: Clearfield Creek, Sinnemahoning Creek, Bald Eagle Creek, Pine Creek, and Loyalsock Creek.

b. Juniata River

The Juniata River is formed by the junction of its Raystown and Frankstown Branches near Huntington, Huntington County. The drainage area contains 3,426 square miles, embracing portions of Somerset, Bedford, Fulton, Franklin, Cambria, Juniata, Snyder and Perry counties. Its length from near Huntington to its mouth at Juniata Bridge is 86 miles. The basin lies within the Ridge and Valley Section. The main valley is narrow, made up of troughs between parallel ridges, and gaps where the river has cut through the mountains. The river channel is rocky, high and steep banks rise abruptly from the water, permitting little bottom land to be overflowed during freshets.

(1). Frankstown Branch, Juniata River

The Frankstown Branch of the Juniata rises in Blair County at an elevation of 1,164 feet. The drainage area contains 9978 square miles embracing portions of Bedford, Cambria, Blair, Center and

Huntington counties. Its length is fifty-six miles. The basin lies in the Ridge and Valley section and the channel has rough rocky beds, flanked with steep banks.

(2) Raystown Branch, Juniata River

The Raystown Branch of the Juniata has its source in Bedford County at an elevation of 1,178 feet. The drainage area is 1,012 square miles, embracing portions of Somerset, Cambria, Blair, Fulton, Bedford and Huntington counties. Its length is 108 miles. The basin lies in the Ridge and Valley section and its channel is through rough and rocky gorges and bordered with narrow flood plains in many places.

3. POTOMAC BASIN

The Potomac Basin occupies the middle southern portion of the state and includes all the area in Pennsylvania draining into the Potomac River, embracing portions of Franklin, Bedford, Fulton, Adams, Somerset and Cumberland counties. The total area drained in Pennsylvania is 1,570 square miles. The streams in this basin drain small areas. The largest area drained in this basin by any of the streams in Pennsylvania is 499 square miles, which is drained by Conococheague Creek.

4. GENESEE BASIN

The Genesee Basin occupies a small part of the middle northern portion of the state, in Potter County, and in-

cludes all the area in Pennsylvania draining into the Genesee River.

a. Genesee River

This stream drains 96 square miles in Northern Potter County of rough and hilly country with narrow valleys between steep hills. The total length of the river in Pennsylvania is 11 miles. The river flows northward through New York into Lake Ontario.

5. ERIE BASIN

The Erie Basin occupies the northwestern corner of the state and includes 512 square miles, all the area in Pennsylvania draining into Lake Erie, embracing portions of Erie and Crawford counties.

The main stream draining this basin is Conneaut Creek which drains 154 square miles in Crawford and Erie counties and has a length of 35.5 miles in Pennsylvania. There are many other smaller streams, the larger of these are Elk Creek and Walnut Creek.

6. OHIO BASIN

The Ohio Basin occupies the western portion of the state known as the Allegheny Plateau Region and includes 15,571 square miles, all the area draining into the Ohio River.

The principal streams draining this basin are: Ohio River, Allegheny River and Monongahela River, with their tributaries French Creek, Clarion River, Kiskiminitas River, Youghiogheny River and Beaver River.

a. Ohio River

The Ohio River is formed by the junction of the Allegheny and Monongahela Rivers at Pittsburgh at an elevation of 703 feet.

The total area drained by the Ohio in Pennsylvania is 15,571 square miles or 34.5 per cent of the total area of the state, embracing all of fourteen and portions of 10 counties in the western part of the State.

The length of the Ohio to its mouth at Cairo, Illinois where it enters the Mississippi River is 967 miles. Its length in Pennsylvania is 39.4 miles.

The river channel is through a narrow valley flanked with steep hills, and containing little lowland. The channel is broad and shallow but has been improved for navigation by a series of locks and dams, creating a 9 foot channel.

(1). Beaver River

The Beaver River, tributary to the Ohio, has its source formed by the junction of the Mahoning and Shenango rivers in Lawrence County and drains a total area of 3,040 square miles; in Pennsylvania, 1,784 square miles, embracing portions of Crawford, Mercer, Butler, Lawrence,

Allegheny and Beaver counties. The river basin above New Castle lies in the glaciated region containing broad valleys, swamps, and lakes.

South to Wampum the valley is broad with wide flat bottom and from this point to its mouth at Rochester, the valley is narrower and gorge-like with many river terraces and rolling hills beyond. Some of the tributaries in their lower courses cut through deep narrow ravines. The channel in places, has cliff banks that rise to 300 feet above the river, at other places, broad river terraces are located between streams and steep hills. The length of the river is 22 miles from the junction of the Mahoning and Shenango rivers to its mouth.

b. Allegheny River

The Allegheny River is the principal tributary of the Ohio and drains the northern part of the Allegheny Plateau and the greater part of the western slope of the Allegheny Mountains, embracing over one-fifth of the area of the State and a part of the western end of New York. The total area drained by the Allegheny is 11,705 square miles; in Pennsylvania, 9,771 square miles, embracing portions of Erie, Warren, McKean, Potter, Crawford, Venango, Forest, Elk, Mercer, Clarion, Jefferson, Clearfield, Butler, Armstrong, Indiana, Allegheny, Westmoreland, Cambria, and Somerset counties. The Allegheny Plateau region is for the most part a highland carved deeply with many narrow steep-sided valleys. The areas east of the main stream are more

rugged in outline than those to the west. The river drains the western glaciated section which abounds in small lakes and swamps. The Continental Divide forms the eastern margin of the Allegheny Basin, extending to an elevation of 2,800 feet in Somerset County.

The total length of the river from its source in Potter County is 314 miles; its channel flows through many narrow valleys with steep sides and little bottom land. The river is improved for navigation 24 miles from its mouth at Pittsburgh.

The main tributaries of the Allegheny are: French Creek, Clarion River and Kiskiminitas River.

(1). French Creek

French Creek, tributary to the Allegheny has its source in southwestern New York and drains a total area of 1,246 square miles; in Pennsylvania, 1,135 square miles, embracing portions of Erie, Crawford, Mercer, and Venango counties. The area drained by French Creek is rolling country with broad valleys and many lakes and swamps of glacial origin. The total length of French Creek in Pennsylvania is 78 miles and has its mouth at Franklin, Venango County. The channel is through marshes, swamps, deep pools, lakes and broad flats. The banks are steeper and narrower in its lower course.

(2).. Clarion River

Clarion River, tributary to the Allegheny has its source in Elk County and drains a total area of 1,231 square miles, embracing portions of McKean, Elk, Jefferson, Forest and Clarion counties. The river drains a dissected plateau of rough character, with streams flowing in narrow steep-sided valleys without bottom lands. The length of the river is 95 miles and has its mouth near Parkers Landing, Clarion County. The channel is tortuous, bordered with steep rocky banks.

(3). Kiskiminitas River (Including Conemaugh River)

Kiskiminitas River, tributary to the Allegheny, has its source formed by the junction of little Conemaugh River and Stony Creek at Johnstown, Cambria County and drains a total area of 1,891 square miles, embracing portions of Cambria, Somerset, Indiana, Westmoreland and Armstrong counties. The land surface drained by this river varies from a high, gently rolling plateau at head waters with elevations up to 2,800 feet, to a region less than 1,100 feet marked by narrow steep sided valleys and with high intervening ranges of mountains, through which some of the streams have cut narrow gorges. The length of the river is 78 miles and has its mouth at Freeport. The channel is through shale, and sand-stone strata which forms

steep banks, being gorge-like in many places. Other areas have alluvial flood plains, upon which many towns are located.

c. Monongahela River

Monongahela River, tributary to the Ohio, is formed near Fairmont, West Virginia at an elevation of 858 feet and flows northeasterly into Pennsylvania draining a total area of 7,340 square miles; in Pennsylvania, 2,728 square miles; embracing portions of Greene, Fayette, Somerset, Washington, Westmoreland and Allegheny counties. The basin lies west of the Allegheny Mountains and drains their slopes. The valleys in general are narrow with steep hill sides. From Fairmont to the Pennsylvania border the hills are close to the river and only a few small areas of bottom land are found, but below that point to the north there are a number of stretches bordering the river for several miles. Near Pittsburgh the flats become more extensive and in some cases are one-half mile in width. The total length of the river is 128 miles; in Pennsylvania, 91 miles. The channel is through mountainous and hilly regions, carved in shale and sandstone in the upper basin and in alluvial clay and gravel in the lower basin. The main tributary to the Monongahela is the Youghiogheny River.

(1). Youghiogheny River

The sources of the Youghiogheny is in Prest-

on County, West Virginia at an elevation of 2,900 feet. It flows northward into Pennsylvania and drains a total area of 1,732 square miles; in Pennsylvania, 1,265 square miles, embracing portions of Fayette, Somerset, Westmoreland and Allegheny Counties. The greater part of the basin is rough and drains western slopes of the Allegheny mountains. Many of the small tributaries in the upper region, flow through deep, narrow valleys with wooded slopes. The channel is through mountainous and hilly regions, some places are very rugged, the stream falling over ledges and boulders that have dropped from the slopes. The total length of the river is 125 miles; in Pennsylvania, 83 miles. The mouth of the river is at McKeesport where it enters the Allegheny River.

CLIMATE

Pennsylvania's climate is divided into three sections: eastern, central and western. The eastern section comprises the comparatively few counties in the eastern part of the State that are drained by the Delaware River and its tributaries. The central section comprises the large middle portion of the State drained by the Susquehanna River and its tributaries, and the Potomac and Genesee river basins. The western section includes the portion drained by the Ohio River and its tributaries and the small area that drains into Lake Erie.

A. Eastern Section.

Precipitation

Excessive rains are not infrequent, and amounts in excess of 7. inches within 24 hours have been recorded on numerous occasions. Stroudsburg received 7.50 inches in 4 hours on August 1, 1913, Mauch Chunk 8.66 inches within a period of 24 hours on May 20-21, 1894, while Milford reported 9.78 inches in less than 36 hours. The excessive precipitation from coast storms seldom extends inland beyond the first ridge of mountains. The average precipitation for this section is approximately 46 inches per year, which is almost ideal from an agricultural standpoint. The rains during the crop growing season are usually ample and are fairly dependable. However, there are occasional droughts which occur in July and August, but not long enough to destroy the crops. The snowfall is moderate-

ly heavy in the northern counties, but is comparatively light in the southern counties. Very little snow falls in the southern portion of the section after April 1, and in November the snows are generally light and do not remain long on the ground. A large part of the winter precipitation is rain or rain and snow mixed. The average annual snowfall at Philadelphia is about 23 inches, the ground being snow covered an average of 28 days during the winter season. In the central and northern counties these figures are approximately doubled.

Temperature

Temperatures of 100° or higher are seldom recorded in this section, but high relative humidity sometimes makes the temperatures oppressive. During the hottest periods in summer the wind movement is generally light and affords very little relief. These periods are not often protracted beyond a week or ten days, and frequently break up over night with fresh north-east winds. The winters in the southern portion of the section are mild, there being an average of less than 100 days with the minimum temperature below the freezing point, while zero temperatures are not reached more than two or three times during a winter season. The summer mean in the extreme southern portion is about 73°, and the winter mean about 32°, while the northern portion has a summer mean of about 66°, and the winter mean about 23°. The extremes of temperature are greater in the valleys than in the uplands. In the southern, or agricultural, portion of the section, the first killing frosts of autumn

YEARLY PRECIPITATION AVERAGES

PENNSYLVANIA • 1888 - 1933

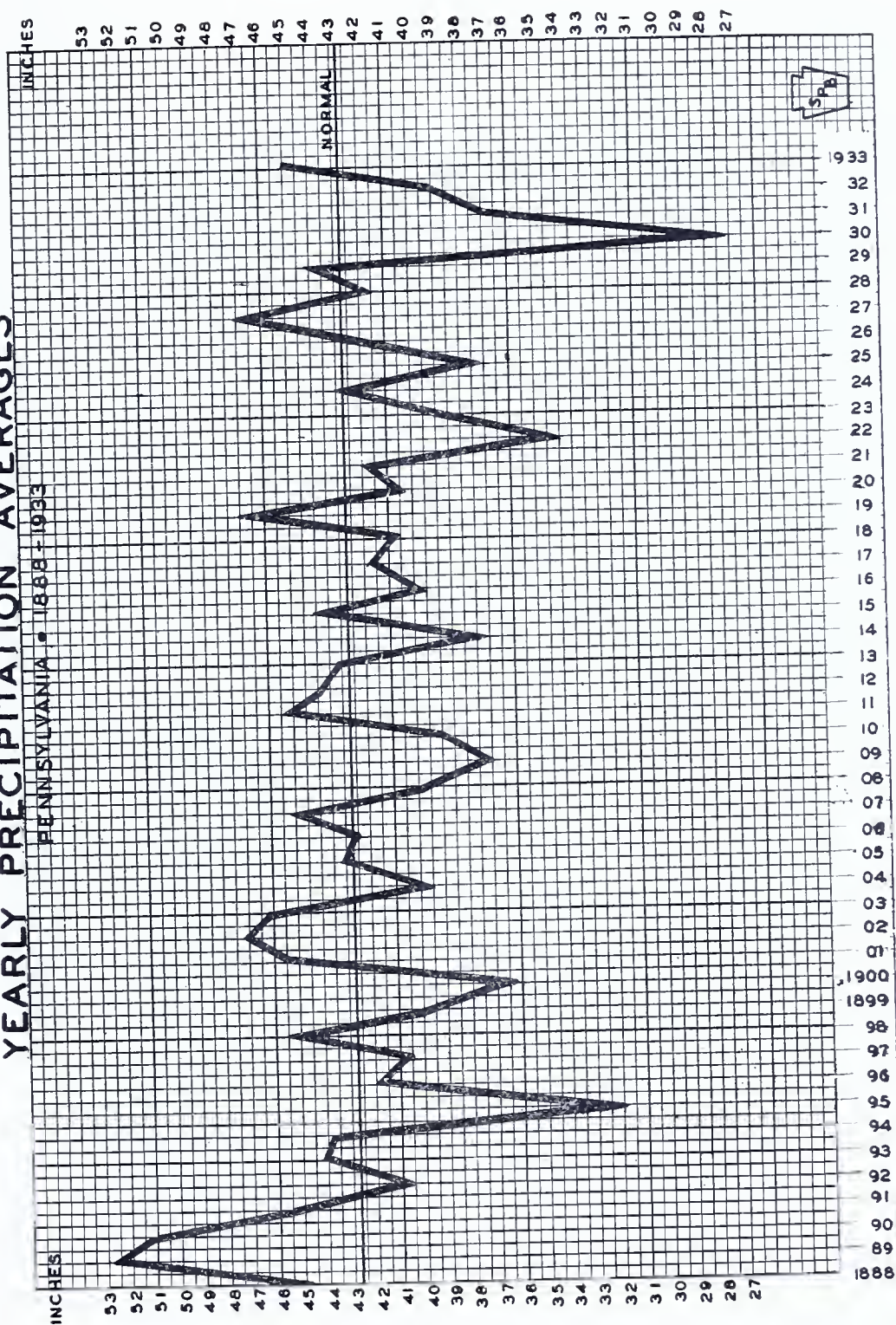
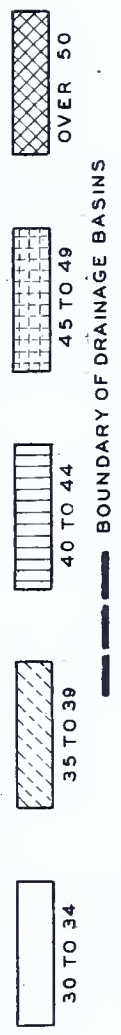
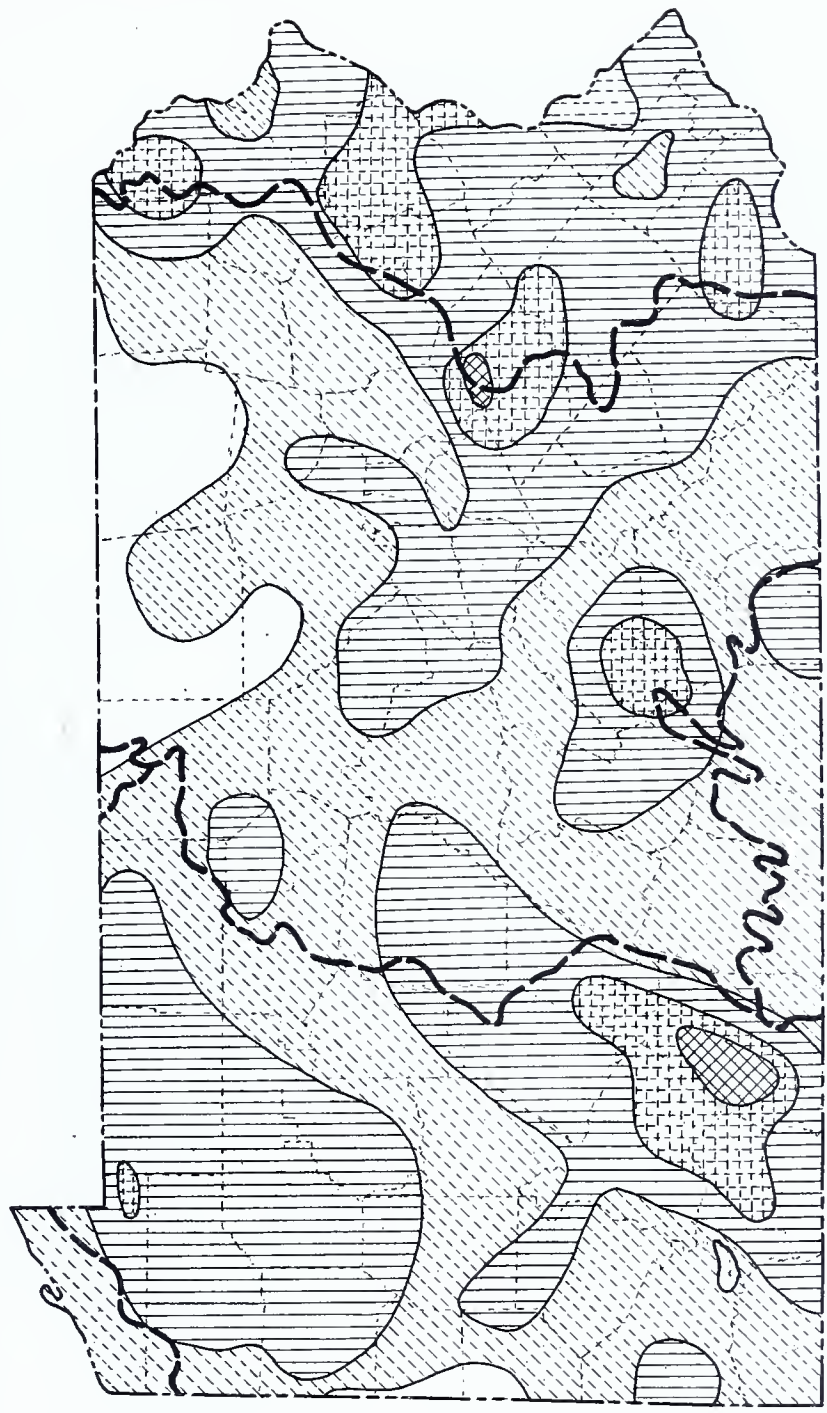


FIGURE NO. 19

GEO. S. BLISS METEOROLOGIST

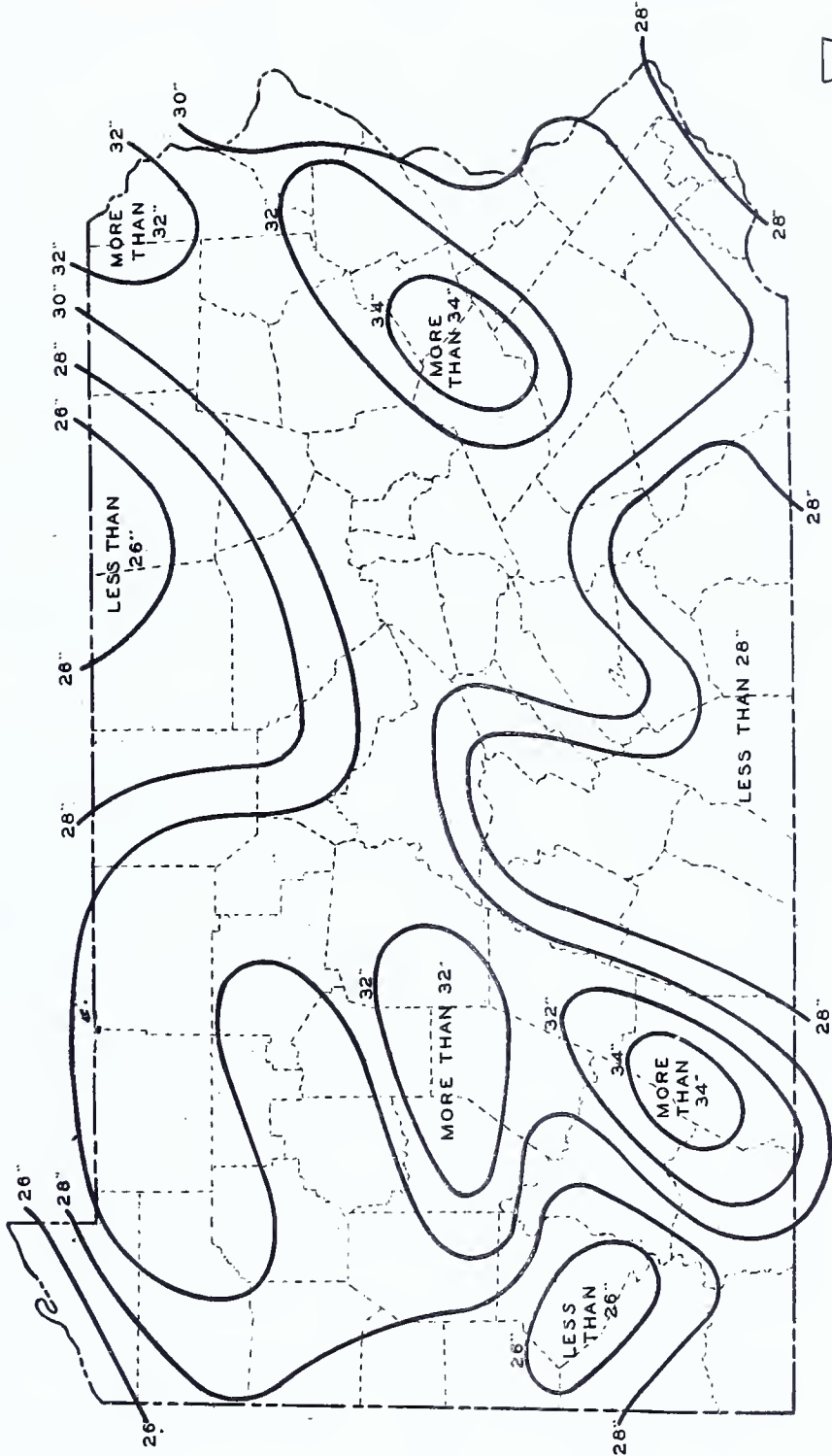
MEAN ANNUAL PRECIPITATION IN INCHES.



SPB

FIGURE NO. 20

AVERAGE RAINFALL IN INCHES DURING GROWING SEASON



U.S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

FIGURE NO. 21

usually occur about the middle or latter part of October, and the last in spring are generally during April.

Winds

The prevailing winds are from the northwest in winter and the southwest in summer, and the wind movement is generally light or moderate.

Thunderstorm winds sometimes reach high velocities and do considerable local damage, especially by the beating down of grain and corn.

B. Central Section.

Precipitation

The average annual precipitation for the whole section is 40.74 inches. The snowfall is moderately heavy, averaging about 50 inches annually in the northern and from 35 to 40 in the southern portion. There is a narrow belt along the western border of the section where the average snowfall is above 60 inches. The last heavy snow of the season usually occurs in the latter part of March, the average April snowfall being about one inch. In autumn there is little snow before the middle of November, and the November snowfall averages a little more than 2 inches. The southern portions of the section are subject to severe thunderstorms; heavy local rains amounting to 5 or 6 inches in 24 hours and to as much as 8 or 9 inches for a single storm have been recorded in many instances.

In the northern part of the section the growing season is occasionally too short for some crops, especially corn, and

periods of summer drought are not uncommon. The average annual precipitation for the northern region is 36 inches, which is enough for those seasons when it happens to be well distributed.

The central portion of this section, which includes most of ridge and valley region, has an average precipitation of about 42 inches. The valley lands are comparatively free from damaging frosts and have a growing season nearly as long as that of the southern counties.

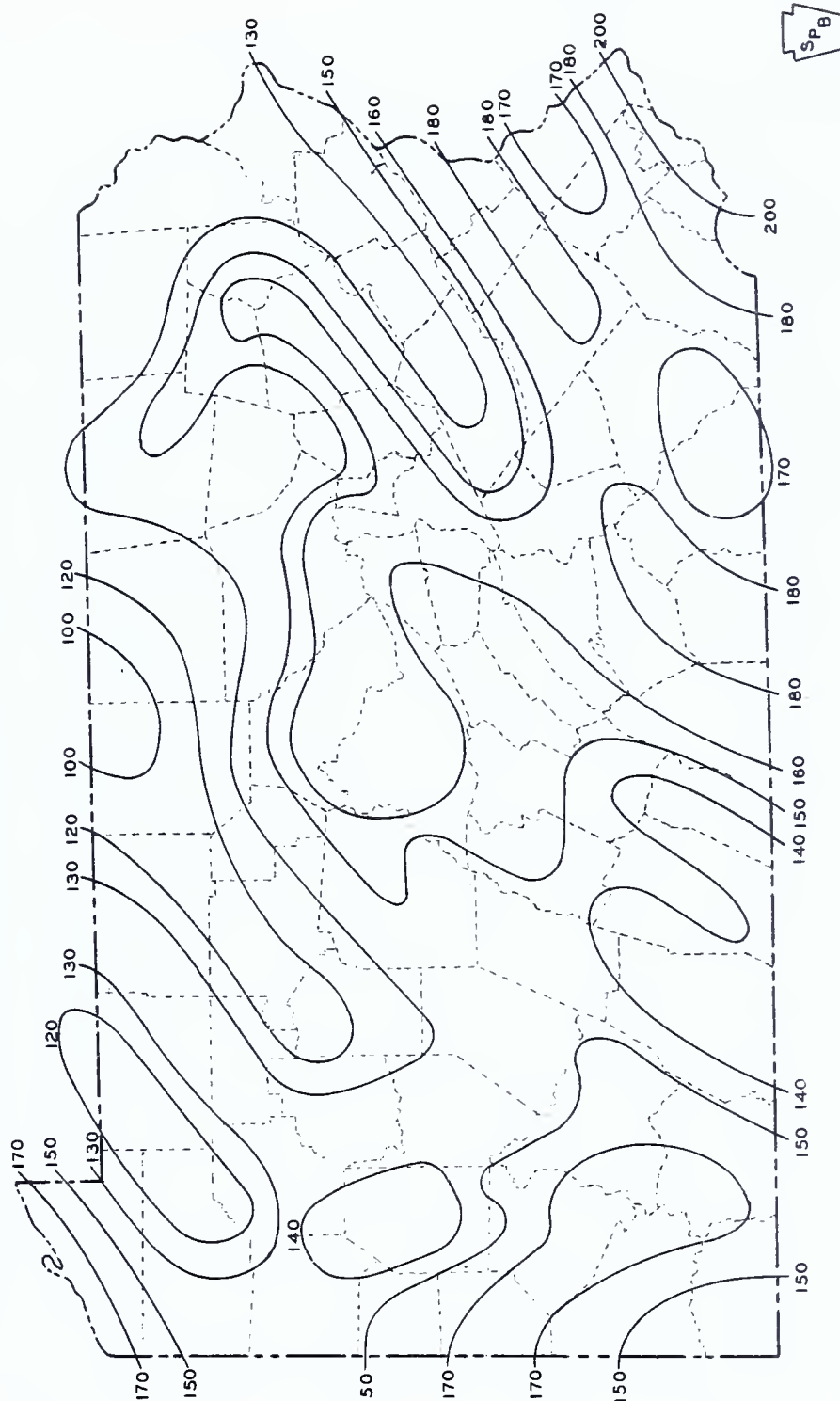
The precipitation for the rolling southeastern portion of the section is 42 inches per year, and fairly dependable.

Temperature

The mean temperature in this section decreases about 6° from south to north. In the northern highlands the summer mean is about 67° and the winter mean about 24° , while in the southeastern counties the summer mean is about 72° and the winter mean about 30° .

Temperatures 100° or higher occur in the southern counties practically every summer season, while mid-winter temperatures of 20° to 25° below zero or lower are occasionally recorded in the northern highlands and in the mountains southward almost to the State line. Maximum temperatures of 90° or higher are recorded an average of 10 days for each summer season, while the average number of days with freezing is a little more than 100. In the southeastern portion the last killing frost in the spring usually occurs about the middle

AVERAGE LENGTH OF GROWING SEASON IN DAYS



SP

46°

48°

50°

52°

54°

BELOW

46°

48°

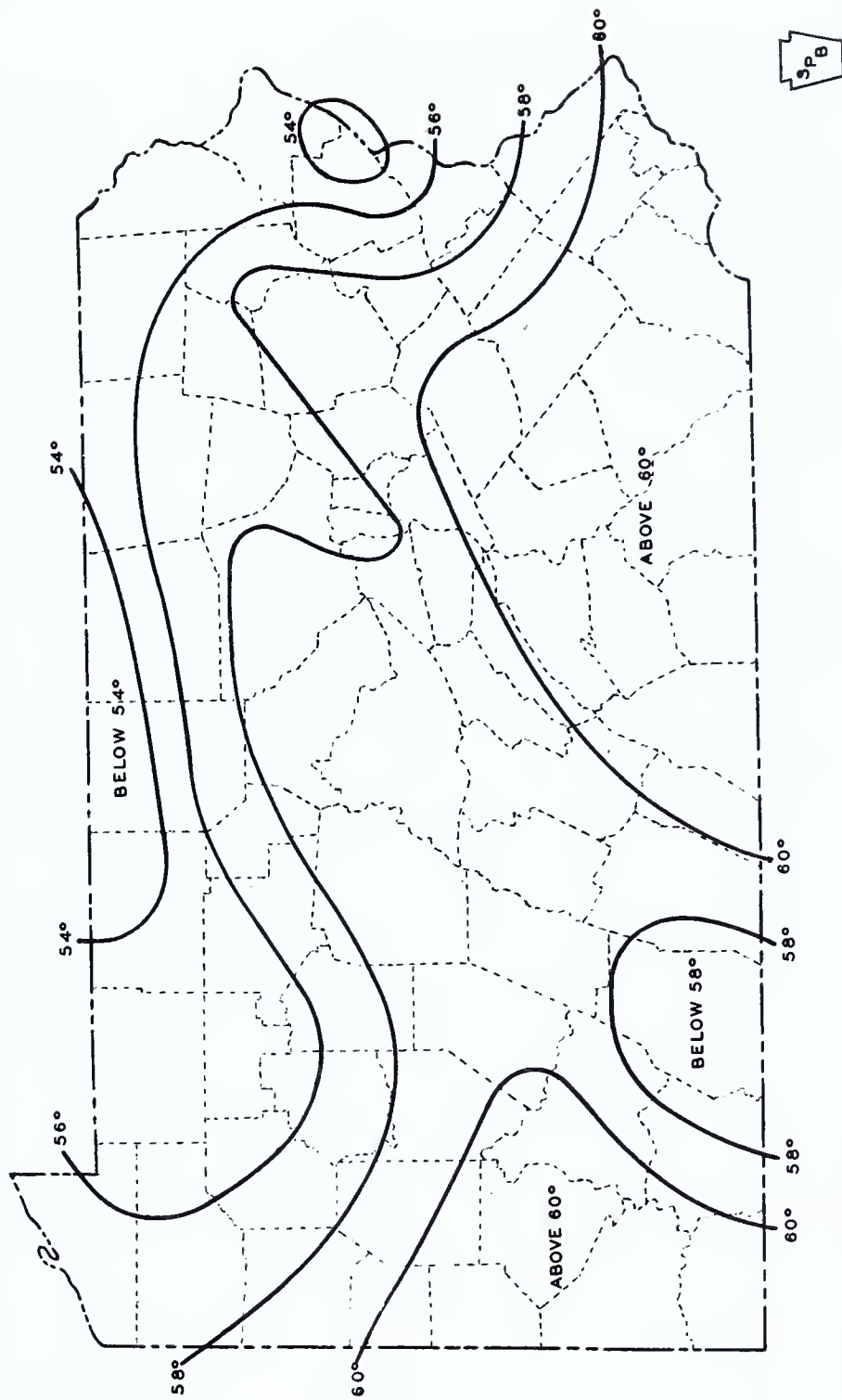
50°

52°

54°

FIGURE NO. 23

MEAN TEMPERATURE - MARCH TO OCTOBER INCLUSIVE



U.S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

FIGURE NO. 24

of April, and the first in autumn about the middle of October, giving about 180 days for the growing season.

Winds

In the northern part of the section the winds are mainly from the west and northwest, and in the central and southern parts mainly from the west and southwest.

C. Western Section

Precipitation

The average annual precipitation for this section is nearly as great as that for the central and eastern sections, but occurs as a rule in smaller amounts and at more frequent intervals. Rainfalls in excess of 2.50 inches in 24 hours are comparatively rare. The average annual precipitation for the section is 42 inches, being generally heaviest in the northern and southeastern counties and lightest along the Ohio border. The snowfall is moderately heavy, and the snow lies on the ground longer than it does in the eastern part of the State. The average snowfall for the section is 50 inches. Heavy snows appear occasionally in the northern counties as late as the middle of April.

Temperature

This section is subject to somewhat lower temperatures and to more frequent and sudden changes than occur in the remainder of the State, excepting the northern tier of counties. Temperatures of 100° or higher are recorded in the southern portion and there is an average of about 15 days annually with tempera-

tures of 90° or higher. The winters are moderately cold, there being an average of 100 days or more with freezing temperatures, while temperatures of 20° or more below zero are recorded in the northern counties nearly every winter.

The summer mean in the northern counties is about 66° and the winter mean 25° . In the southern portion the summer mean is about 71° and the winter mean about 30° .

Winds

In Warren County on the north the prevailing winds are from the northwest. In Indiana County south and southwest, and Fayette County southwest. At Pittsburgh the prevailing winds are west and northwest.

AVERAGE DATE OF LAST KILLING FROST IN SPRING

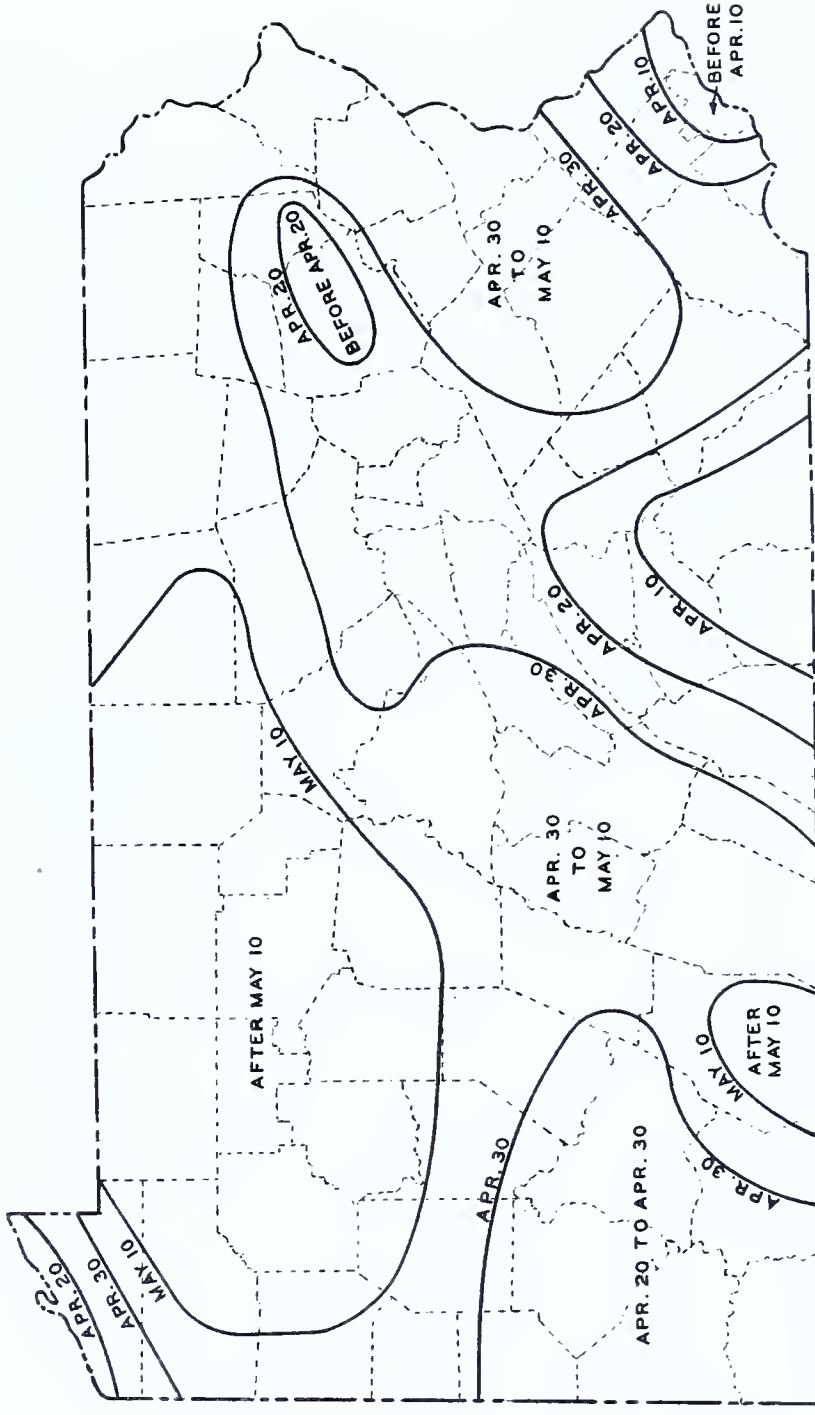


FIGURE NO. 25

FIGURE NO. 26

SPB

AGRICULTURE*

Since the early settlement of Pennsylvania, agriculture has been one of the leading industries of the state. At first, the farms were practically self-sufficing, producing all the necessities for which the area was adapted. Very little produce was sold except a few cash crops such as tobacco and wheat. As foreign trade increased and local industry developed more and more produce was needed to feed the rapidly growing urban population. Today farming in Pennsylvania has become more specialized and most of the production is for sale.

The estimated cash income of Pennsylvania farmers in 1933 was \$170,776,000**. Of this amount more than \$78,000,000 was from dairy products and \$26,000,000 from chickens and eggs. All field crops accounted for a cash income of \$30,000,000, fruits \$8,000,000, and truck, nursery and greenhouse products \$13,000,000.

In 1933, according to the Federal-State Crop Reporting Service, Pennsylvania ranked ninth among all states in total cash income from farm products sold. In the same year, it ranked second in cash income from eggs, third in cash income from chickens, potatoes and milk, and fifth in cash income from apples. It also stood high in cash income from the production

* Prepared by Mr. David H. Walter, Land Planning Consultant for Pennsylvania, National Resources Board.

**Federal-State Crop Reporting Service.

of greenhouse products and truck crops.

Physical Factors Affecting Agriculture

"Crops that can be produced to advantage in any area are basic to the types of farming in that area. These are greatly affected by topography, growing season, and soil.

"Topography. The topography of the State is discussed elsewhere in this report. The fairly level area in the southeast, comprising about one-sixth of the total land in the State, contains nearly one-fourth of the land in farms. In the west and north, crop land is limited to the valleys. Beyond these high ridges, to the west and north is the Allegheny plateau. The crop maps show how the kind, amount, and proportion of the various crops grown have been affected to a large extent by the topography.

"Length of Growing Season. Both the northwestern and southeastern extremes of the State are near large bodies of water and have relatively low elevations. These features are associated with growing seasons of 170 to 200 days. Between are the mountain ranges and plateaus, with growing seasons as short as 140 days in the south central part and 90 days in the north central part. The shortest growing season is about the same length as that in western Wyoming and Montana. The areas of longest growing season are similar in this respect to southern Illinois and southeastern Kansas. The area of short growing season is limited largely to the production of hay, pasture, oats, buckwheat, corn for silage and potatoes. The areas

of long growing season have a large part of their crop acreage in corn for grain and winter wheat.

"Rainfall. In normal years, rainfall is adequate to produce good crops. The State, as a whole, has 35 to 50 inches of rainfall in an average year. The areas of heaviest rainfall are in the southeastern part and on the western slopes of the Allegheny Mountains; here the annual rainfall exceeds that of Illinois by 10 to 15 inches.

"Soil. Reconnaissance soil surveys of Pennsylvania were made from 1908 to 1912. The results are combined in one map. More detailed surveys for 18 counties have been published. The accompanying figure shows 14 of the most important soil types. The value of any type of soil for farming depends in part on whether it is clay, loam, silt, sand, gravel, stone or some combination of these textures. Considerable areas of the Dekalb soil series, which predominates through the mountainous area and west to the last tier of counties in the northern half of the State, owing to the high stone content, degree of acidity and low amount of plant food elements, are unsuited for farming. In general, the Dekalb soils are not so useful for farming as the Hagerstown, Chester and other soils in the southeastern, or the Westmoreland soils in the southwestern part of the State. The Volusia soils of the northwestern and northeastern parts of the State are poorly drained in some areas. Oats, buckwheat, hay and pasture are less sensitive to lack of drainage than is corn, consequently they predominate on the

Volusia soil types." *

Soil Acidity. A study of the lime requirements of the soils of Pennsylvania shows the highest degree of acidity in the northern counties. In these counties, where liming has not been practiced, applications of over two tons per acre now are necessary to obtain the most satisfactory crop yields. South of this area along the Appalachian Mountains and in the western part of the state, the requirements are considerably less, ranging from one-half to two tons per acre. The highly productive soils of southeastern Pennsylvania have a natural supply of limestone and usually require only limited amounts. The cost of lime, especially in the northern area, is a limiting factor in crop production.

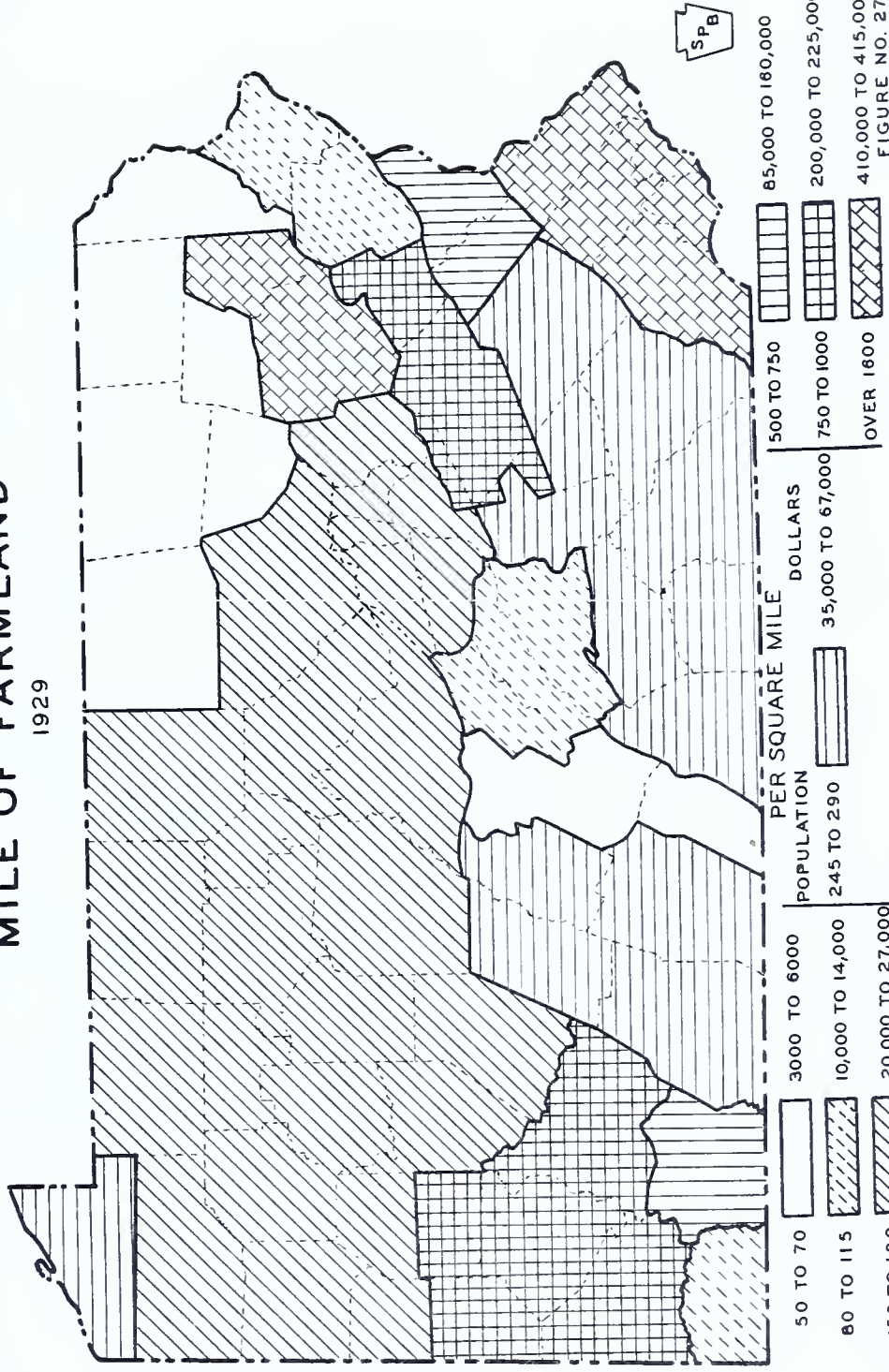
MARKETS FOR FARM PRODUCTS

"Next to the physical features, which determine what the farms can produce, available markets are the most potent factor in determining what is grown. An accompanying figure shows the population per square mile of farm land in various sections of the State. The area of farm land includes all land in farms, whether in crops, pasture, woodland or waste. It also shows the amount paid out annually by the industries, in salaries and wages, per square mile of farm land. Thus, in the upper half of the anthracite coal area, comprising Lackawanna and Luzerne

*Emil Rauthenstein and F. P. Weaver, Pennsylvania Agricultural Experiment Station Bulletin 305.

POPULATION AND INDUSTRIAL PAYROLL PER SQUARE MILE OF FARMLAND

1929



PENNA. AGRICULTURAL EXPERIMENT STATION BULLETIN NO. 305.

Counties, there was paid in salaries and wages in industry \$416,000 for every 640 acres of land in farms. In the southeastern area, comprising five counties with 1,356 square miles of farm land, the industrial salaries and wages amounted to \$412,000 for every square mile of farm land. These two areas had, for each square mile of land in farms, from 1,600 to 2,000 non-farm people as purchasers of the farm products. Contrast with these areas the six counties in northeastern Pennsylvania, which have only 54 non-farm people and only \$3,000 of salaries and wages in industry per square mile of farm land. This area has no city of 20,000 people or over, while the other two areas, with only slightly more than half as much farm land, have nine such cities, one of almost 2,000,000 and three of over 50,000.

"These differences in population and industrial development have had a profound effect on the types of farming possible in each district. The northeastern area has very limited local outlets for products, but its relative nearness to the metropolitan area of New York and New Jersey makes possible an extensive fluid milk development. Farming in the southern portion of this area is affected by proximity to the anthracite coal mines. While there are striking differences in the soil, topography and climate of the northeastern and southeastern areas, the relative capacity of available markets accounts, in part, for the fact that the former produced farm products worth only about \$16 for every acre of land in farms, and the latter \$42.

"The second largest center of population in the State is Pittsburgh. An area, comprising approximately four and one-half counties, surrounding Pittsburgh had almost 1,000 people and paid over \$220,000 in industrial wages for each of the 2,000' square miles of farm land. The second lowest areas in population and in industrial production per acre of farm land are in central Pennsylvania, the extreme northeast, and in the southwest, where several counties have from 80 to 115 people and from \$10,000 to \$14,000 of industrial payroll per square mile of land in farms.

"No part of the State is over 200 miles from some market of considerable capacity, but the areas adjacent to these markets have decided advantages over those 100 to 200 miles away. This has led to differences in types of farming. The best market opportunity for milk, eggs, fruits and other cash crops, for a few farmers, exists near the many small cities in the State where competition, with produce shipped in by rail is less severe. The capacity of these cities for such products is limited and production is easily overdone; only near the large centers of population have the majority of farmers, because of growing opportunity to sell cash crops and livestock products, made changes in their type of business to such a degree as to show in a statistical analysis of census data."*

*Emil Rauthenstein and F. P. Weaver, Pennsylvania Agricultural Experiment Station Bulletin 305.

LAND USE IN PENNSYLVANIA

Total Land Area in Farms. The total land area of Pennsylvania is approximately 28,692,000 acres. Slightly over 53 per cent in 1930 was classed as farm land. The remaining 47 per cent was largely in urban centers and forests. As the physical features and markets would indicate the highest percentages of land in farms occur in the southeastern and western areas. The area of lowest percentage in farm land is in Cameron, Elk and Forest Counties. Only 8.4 per cent of the total land in Cameron County was farm land in 1930, compared to 88.5 per cent and 85.9 per cent in farm land for Greene and Lancaster Counties, respectively. The low percentage of farm land along the Appalachian Mountains is due to the presence of considerable rough land unsuitable for farming.

Crop Land. Farm land is classified by the census into crop land, pasture land, wood land not pastured, and all other land. Crop land includes all areas that had been devoted to harvested crops, crop failures and idle or fallow land. Twenty-seven per cent of the total land area of Pennsylvania and 51 per cent of the farm land in 1929 was in crop land.

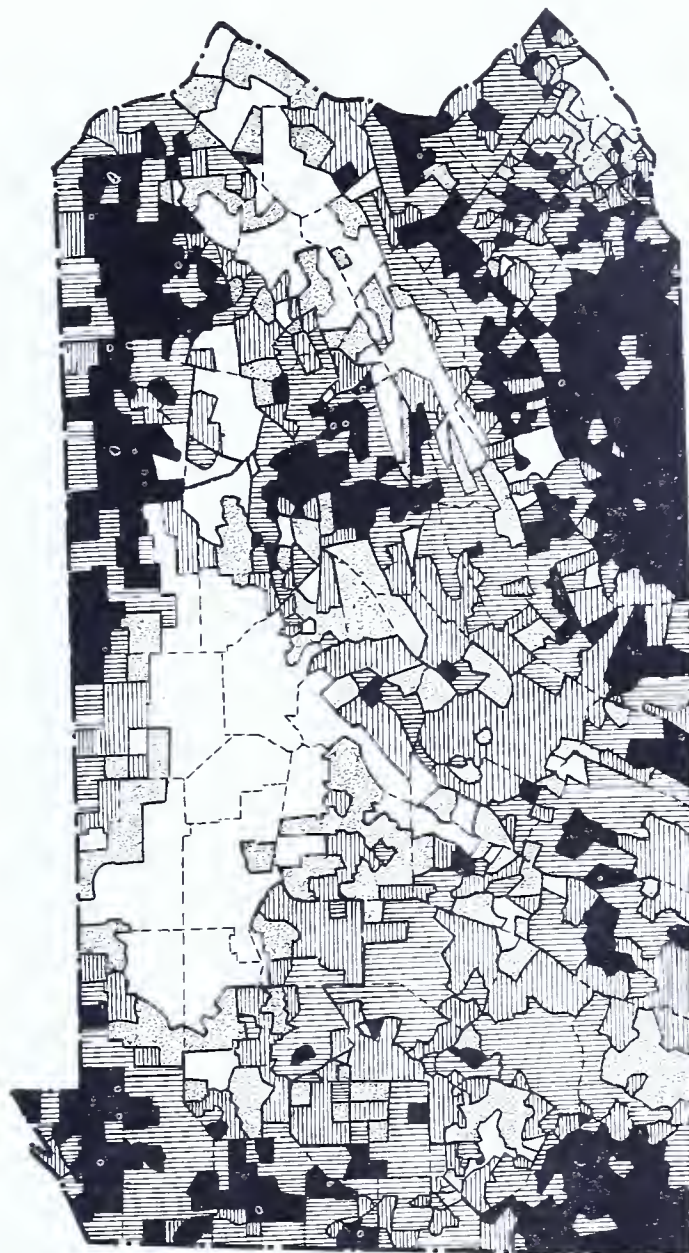
The distribution of the percentage of total land area in crop land corresponds somewhat closely to the percentage distribution of total land area in farm land. Physical conditions and types of farming are largely responsible for the difference.

The southeastern area has by far the greatest percentage

of its area in crop land. In Lancaster County, 63 per cent of the total land area was in crops. The soil is very fertile, there is very little rough land, and the county is located near large markets. In Greene County, southwestern Pennsylvania, the per cent of land in crops is 25 or slightly below the State average. Here the type of farming and the rolling topography requires a large amount of pasture land. Cameron County and the area surrounding it are low in acreage of crop land. The rough mountainous topography and the poor soil types are largely responsible. Only 2 per cent of the entire area of Cameron County was in crops in 1929.

Pasture Land. The total amount of pasture land as given by the 1930 census was 4,576,192 acres or 30 per cent of the entire area in farm land. This amounts to two-thirds of the area in harvested crops. The accompanying figure shows the distribution and amount of pasture land by minor civil divisions. The areas that clearly stand out as important are the southwestern and northwestern areas and the northern tier of counties east of McKean County. In the southwestern corner of the State sheep raising is the predominating type of farming, which requires extensive pastures. Another reason for a large percentage of pasture land is the serious damage by erosion on the steep hillsides under any form of cropping. The soil in the northern area is adapted to pasture production. As a consequence, dairymen must rely upon the home grown hay and pasture and purchased grains to feed their livestock. The southeastern

TOTAL LAND AREA IN FARMS. BY TOWNSHIPS.



OVER 80

61 - 80

41 - 60

21 - 40

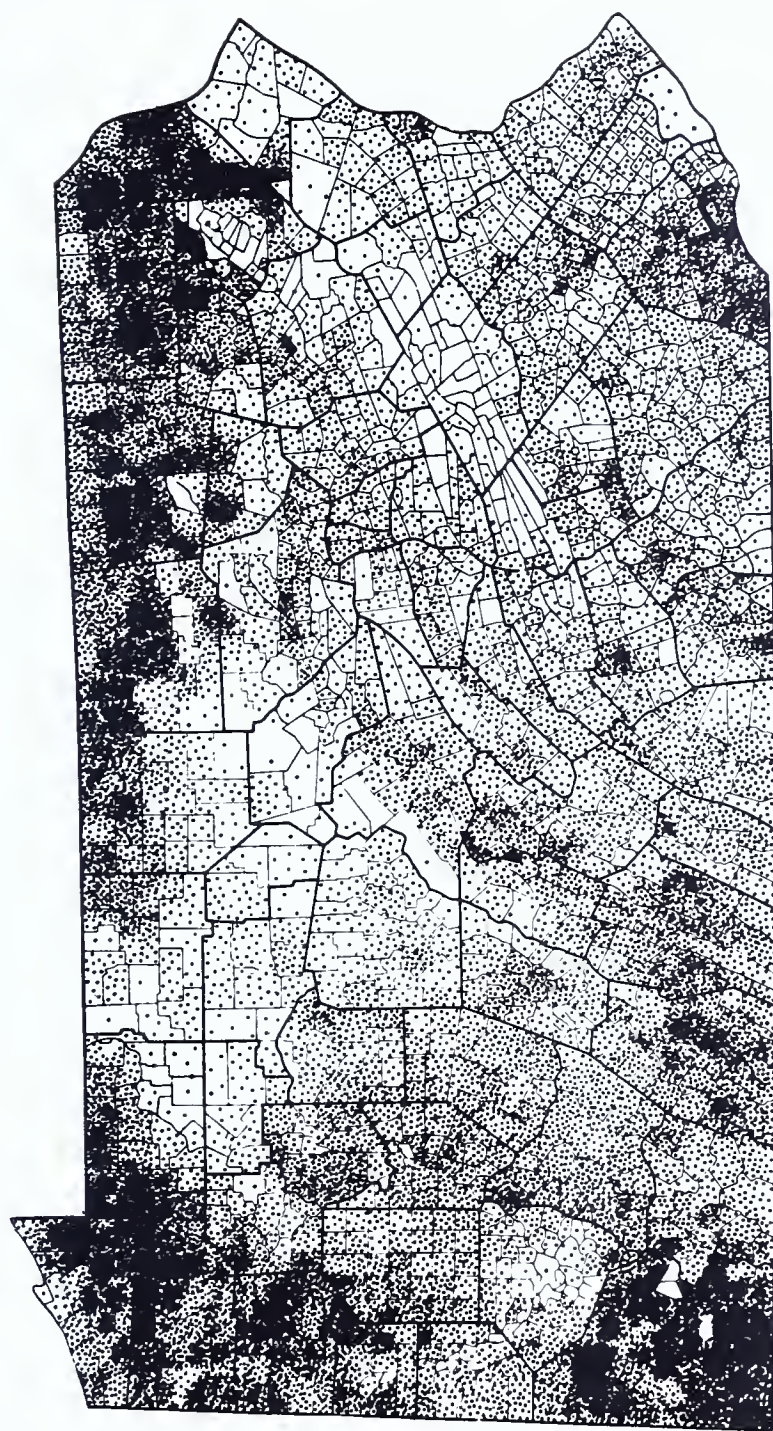
0 - 20

PERCENT

FIGURE NO 28

U.S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS.

DISTRIBUTION OF TOTAL PASTURE 1929



EACH DOT REPRESENTS 200 ACRES



PENNA. AGRICULTURAL EXPERIMENT STATION
BULLETIN NO. 305

FIGURE NO. 29

area has limited acreages of pasture land but are capable of feeding more units of livestock per acre.

Other Land. Land not classed as either crop land or pasture land makes up 19 per cent of the total land area in farms. This area consists of wood land not pastured -- rough, stony, and swampy land unfit for any particular use. The percentage of this land is highest where the percentage of farm land is lowest.

LAND IN CROPS

A wide variety of both field and truck crops are grown in Pennsylvania. Many of them are grown in all sections of the State while others are limited to definite areas. Only a few of the more important and widely grown crops will be discussed.

Corn. According to the census figures, almost 19 per cent of the total crop acreage in 1929 was in corn. Of this, 77 per cent was cut for grain and 18.5 per cent for silage. The balance was hogged down or cut for fodder.

The heaviest production of corn for grain is in the southeastern section and along the two branches of the Susquehanna River. In the southwestern area the corn crop is not so important and is still less so in the northern part of the State. The shorter growing season and cool weather limits the amount of corn that can be grown to maturity in the northern counties.

Introduction of the silo has meant a more even distribution of corn acreage throughout the State. Dairy farms in the

northern areas are able to utilize the corn economically for dairy feed in the form of silage. For this reason a much higher percentage of the crop land in this section is in corn for silage than in any other.

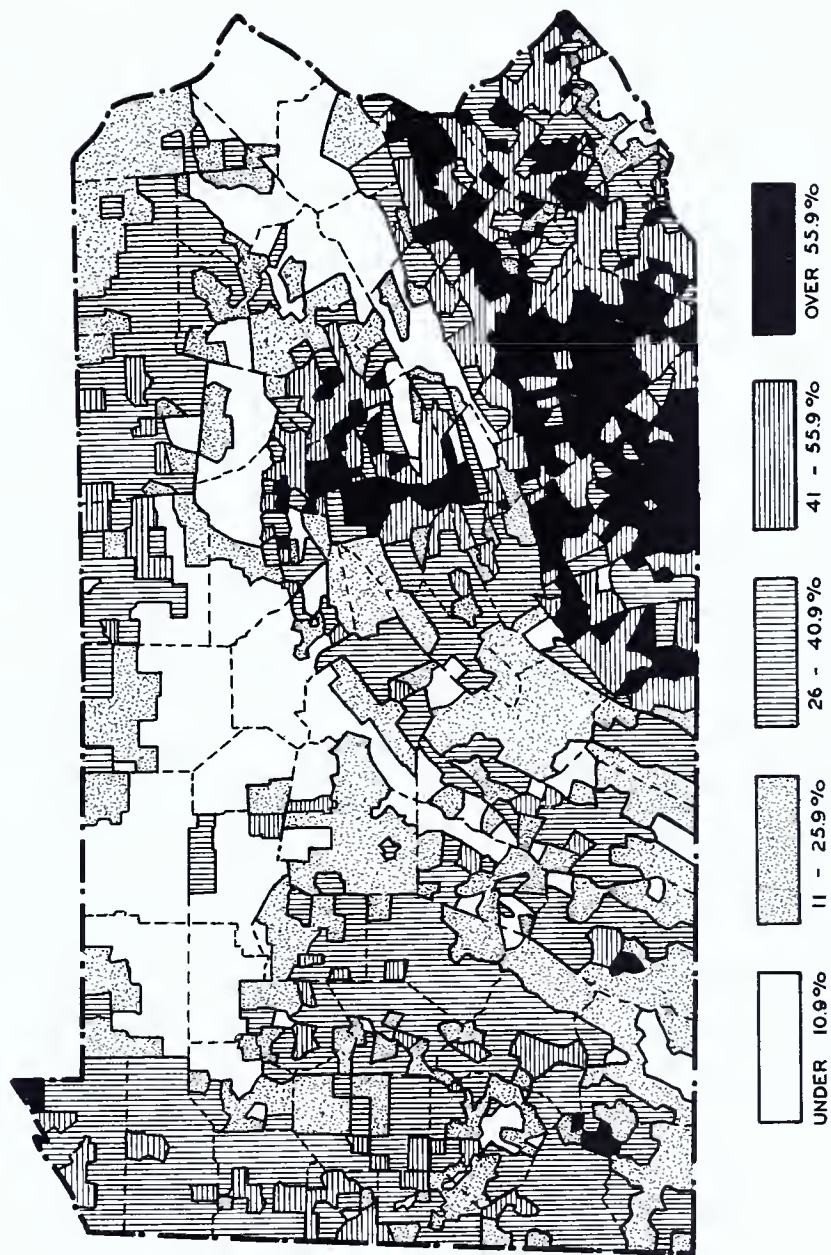
Wheat. The area planted in wheat in 1929 was 15 per cent of the total crop area of the State, or nearly one million acres. This is about the same acreage that was in corn for grain. The distribution of wheat production is quite similar to that of corn for grain. The 27 counties in the southern section produce about 75 per cent of the total production. The acreage in the northern and western regions planted in wheat have steadily declined.

It is difficult for Pennsylvania farmers to compete with western producers of wheat, but the crop is well suited to common crop rotations, yields are relatively high, and it is a good source of a cash income. The acreage probably will continue to be about the same, especially in the southeastern area. Winter wheat is the type universally grown in Pennsylvania.

Oats. The acreage of oats harvested in 1929 was 13 per cent of the total crop land harvested in the State. Because of its wide popularity in common crop rotations and use as a horse feed, oats is grown quite generally over the State. It is adapted to a cooler climate than either corn or wheat and for this reason it is one of the important crops in the northern counties.

Hay. Hay is one crop that is common in every section, being

TOTAL LAND AREA IN CROPS BY TOWNSHIPS



U. S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS.

FIGURE NO. 30

reported in the 1930 census by 81.8 per cent of the farms of the State. More than 2,570,000 acres were in hay, which was 39 per cent of the total crop area harvested. The crop requires a cool climate with plenty of moisture. For this reason the northern counties have a higher percentage of the crop land area in that particular crop.

Hay is grown in the regular crop rotation in Pennsylvania. In the northern areas it is common to have a field in sod for four or five successive years, compared with one or two years in other areas in the State.

Potatoes. The production of potatoes is quite general throughout the State. Soil and climate conditions are very favorable to good yields. There has been a gradual concentration of the production of this crop on the higher altitudes where the cool moist climate affords optimum growing conditions. The important areas are located in Somerset, Cambria, Crawford, Potter and Lehigh Counties. Lehigh County farmers, because of nearness to markets and favorable soil conditions, have greatly increased production during the past 30 years.

In 1933 the Pennsylvania potato crop amounted to 21,357,000 bushels.* According to government estimates, this is about two-thirds of the amount annually consumed in this State, which would indicate a ready market for local production.

* Pennsylvania Crop and Livestock Report.

RELATIONSHIP OF LIVESTOCK TO LAND USE

Income from the sale of livestock and livestock products in Pennsylvania is much greater than the income from the sale of crops. Most of the crops produced, especially the grains, are fed on the farm rather than sold. The economic advantage of having home grown feed is the reason for a close relationship between the number of livestock and acres of crops grown in different areas of the State. Dairying and poultry raising are the leading livestock enterprises.

Milk Cows. According to the census enumeration all cows and heifers on farms April 1, 1930, born before 1928 were classed as milk cows. There were 761,273 head on farms in Pennsylvania on that date. Fluid milk is by far the most important product sold from the dairy enterprise. Because of its perishability, the distribution of dairy cows is thickest near the larger cities. Another factor influencing the location of dairy farms is the ability to produce sufficient hay and pasture. The southeastern area has a distinct advantage in this respect.

The steady increase in consumption of dairy products in the metropolitan areas of Pennsylvania and New York has resulted in an expansion of the dairy business over the entire state. The counties having the greatest increase in number of dairy cows during the past 40 years have been farthest from the central markets. Centre County had a 45 per cent increase.

Mifflin, Snyder, Union, Juniata, Blair, Bedford, Somerset, Franklin, Lycoming and Tioga Counties all had gains of 20 to 42 per cent.

Chickens. The next most important livestock enterprise is poultry raising. More than 15,000,000 chickens were reported on Pennsylvania farms on April 1, 1930. This was almost double the total number reported on farms in this State 40 years ago.

The concentration and distribution of chickens corresponds closely to the production of the grain crops. Partly for this reason, the southeastern section of the State produces the bulk of poultry and eggs. In 1933 the five counties of York, Bucks, Berks, Lancaster and Montgomery produced 30 per cent of the total egg production of the State. Several small concentrated poultry raising centers are scattered over the State, their location determined largely by a good nearby market. Eastern Wayne County is an example of this type of condition.

Types of Farming. The wide variation in physical features and market facilities in Pennsylvania has naturally been responsible for a wide diversification in types of farming. The distribution and importance of the leading crops and livestock have already been shown. The accompanying detailed map of the predominant types of farming based on income shows many of the less general but important enterprises.

Farms in the United States based on incomes were classified by the 1930 census into 12 main types; 10 of which are found in

Pennsylvania. The type of farm most common is the general farm, which comprised 29.6 per cent of the total number of farms. These farms derive less than 40 per cent of their income from any one crop or livestock enterprise. This indicates a wide diversity in crop and livestock production on a large percentage of the farms. The next most important type of farm is the dairy farm, 26.3 per cent of the total in this State falling in this class. More than 45 per cent of all farms in Crawford, Bradford and Chester Counties are dairy farms. The other types of farms are abnormal, self-sufficing, poultry, crop specialty, fruit, truck, cash grain and animal specialty, most of which have a limited occurrence.

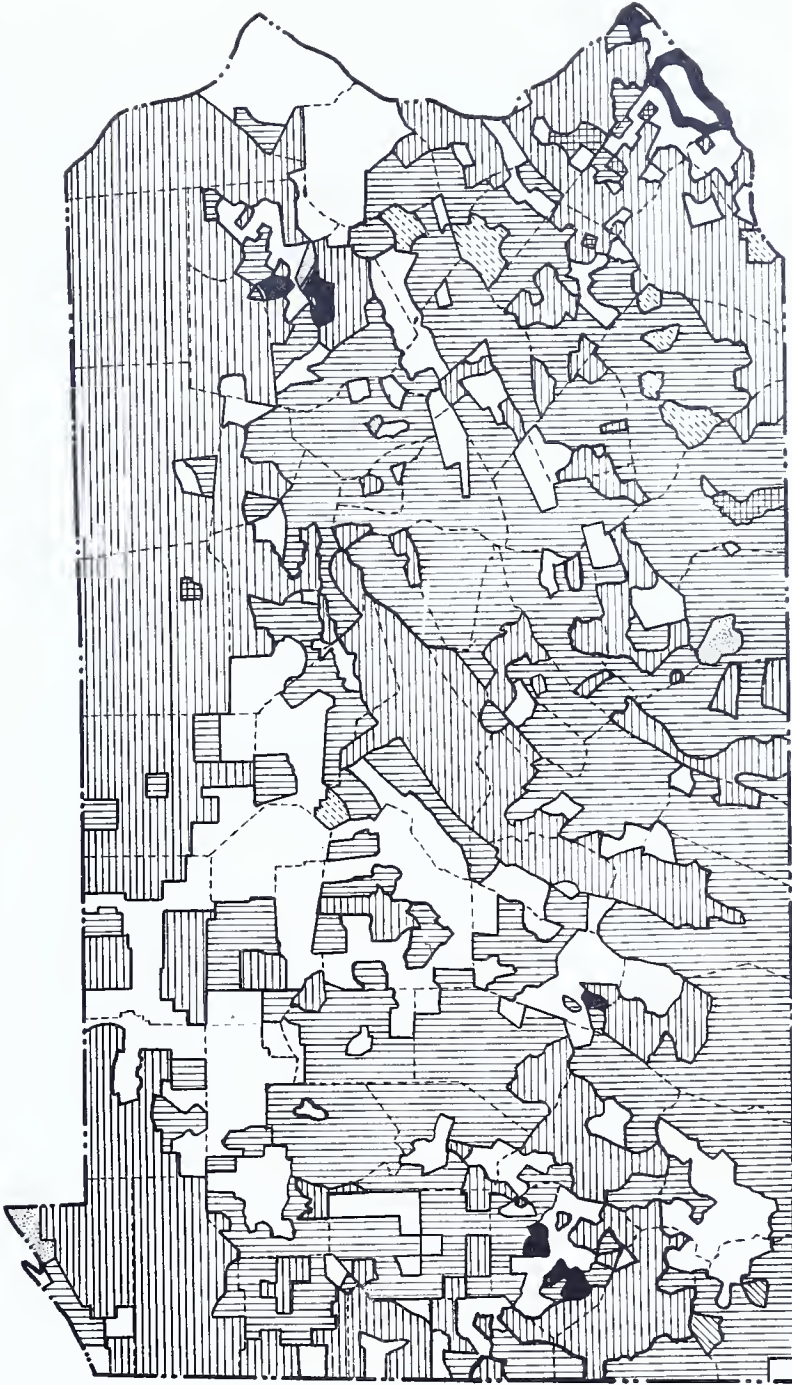
A more general picture of the agriculture of Pennsylvania is shown in the accompanying "types of farming" map. The geographical location and the important types of farming determine the boundaries of the 25 more or less distinct areas. The outstanding fact about these areas is the predominance of dairying which accounted for 45 per cent of the total cash income from farm production in 1933.*

Farm Tenancy. The percentage of farm tenancy in an area indicates roughly the value of the land for agricultural purposes. The better farming areas in Pennsylvania have much more tenancy than the poorer areas. Several good reasons are accountable for this condition. Usually the owner of good land desires

* Federal-State Crop Reporting Service.

PREDOMINANT TYPES OF FARMING

1929



 ANIMAL SPECIALTY
 TRUCK

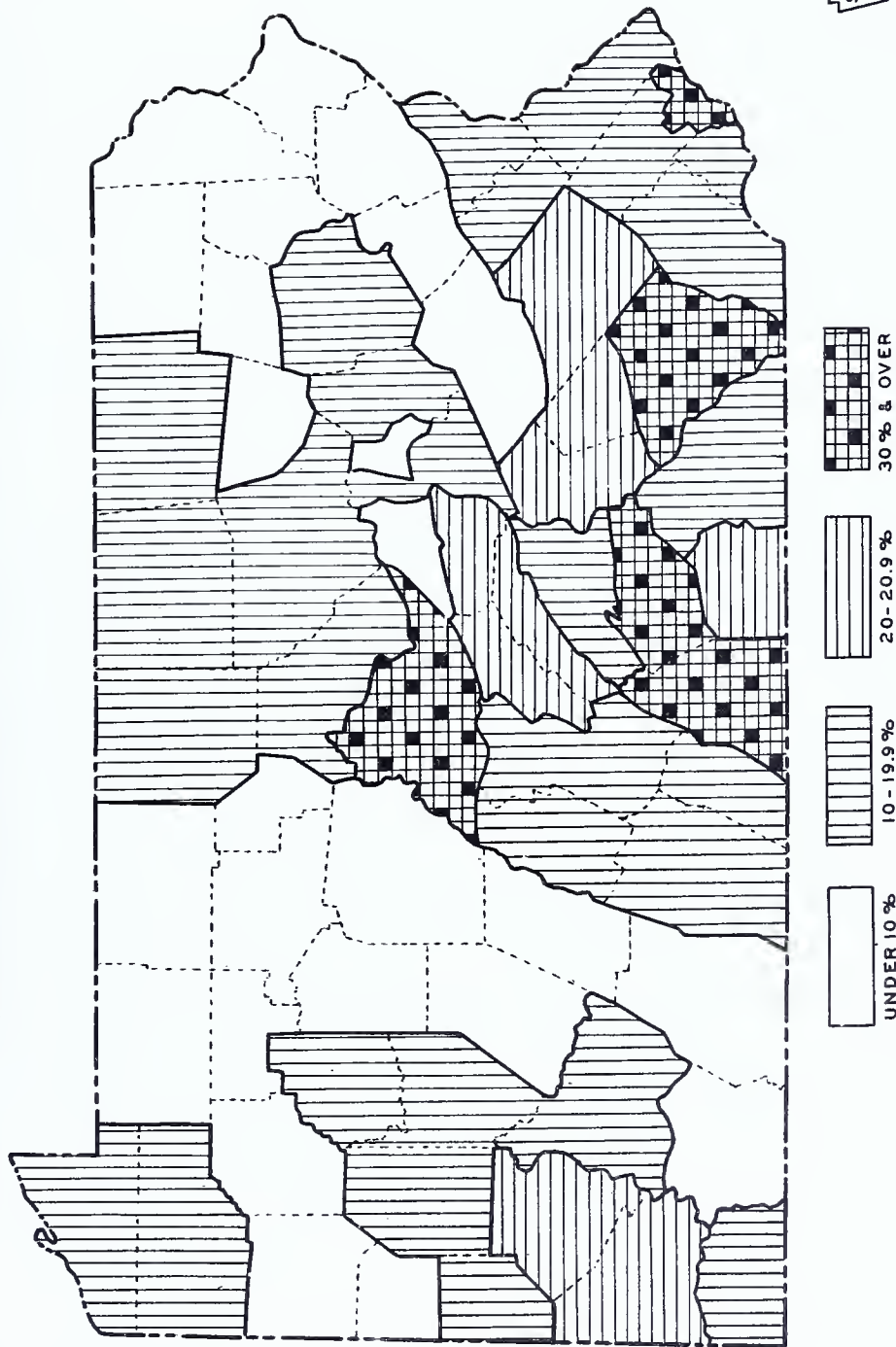

FIGURE NO. 31

 GENERAL
 FRUIT

 CASH GRAIN CROP SPECIALTY
 POULTRY
 ABNORMAL SELF-SUFFICING
 DAIRY

PENNA. AGRICULTURAL EXPERIMENT STATION BULLETIN NO. 305

FARM TENANCY BY COUNTIES



U. S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS.

FIGURE NO. 32

Sp
B

to hold title to it and have someone else do the work. It is usually a good form of investment. Another reason is the ability of a farm to support two families rather than one. In Lancaster County 30.5 per cent of the farms were operated by tenants and only 3.3 per cent in Sullivan County and 3.8 per cent in Carbon County.

Value of Real Estate. The value of farm land depends largely upon the productiveness of the soil for agricultural products. Other factors such as possible building site, mineral deposits, and resort areas have a decided effect on the price of land irrespective of its value for farming. In an accompanying figure is shown by townships the value of land and buildings per acre as reported in the 1930 census.

The areas of high valuation are in southeastern, east central and southwestern Pennsylvania, which corresponds closely to the centers of population. Many of the townships in these areas, according to the 1930 census, have an average value per acre of more than \$150. The outstanding fact, however, is the extremely low land values in the northern, central and south central counties. These areas are identical with the poorer farming areas of the State.

TREND IN THE USE OF FARM LAND

Number of Farms. The number of farms in Pennsylvania in 1870 was a little more than 174,000. Considerable expansion continued to take place until 1900. That year was the peak in the total number of farms, 224,248, or over 50,000 more than in

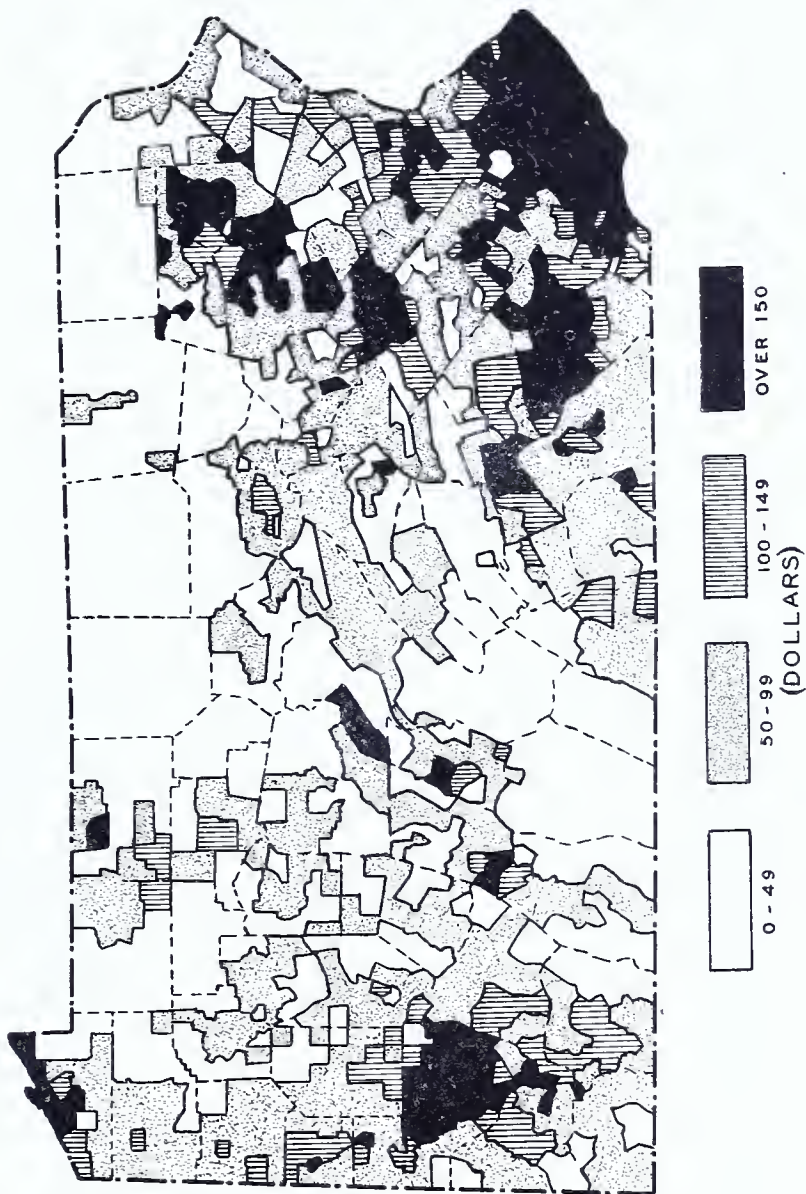
1870. Since 1900 there has been a steady decline in the number of farms. In 1930 there were 172,419 farms in the State, the lowest number of any census year since 1860. The loss in farms between 1920 and 1930 was about 3,000 annually, a 15 per cent decrease in the 10-year period.

Every county in the State showed a decrease except Fayette, which had a 3 per cent increase. The largest decrease in the ten-year period seems to have occurred around large population centers and in the poorer farming areas. The sale of farms for estates and real estate development in the thickly populated areas and farm abandonment in the poorer areas probably accounts for much of the decrease. McKean County in northwestern Pennsylvania had a 32 per cent decrease in the number of farms, Delaware County 46 per cent, and Philadelphia County 45 per cent.

Size of Farms. There has been a steady decline in the number of acres per farm in Pennsylvania. The average farm in the State contained 103.4 acres in 1870 and only 88.8 acres in 1930. Although the size of farms has greatly decreased, the acreage in improved land per farm has not decreased very much. The land is being better utilized.

Because of physical features and market facilities which determine the predominant type of farming, the size of farms varies greatly in different sections. Farms are smallest in Lancaster County, averaging only 53 acres. The largest are in Huntingdon County, near the geographical center of the State,

VALUE OF LAND AND BUILDINGS IN DOLLARS PER ACRE 1930



U.S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS.

SPB

FIGURE NO. 33

Number, Size, and Acres in Farms in Pennsylvania, 1870 - 1930

Year	Acres in Average Farm			Total Number of Farms	Total Acres in Farms
	In Principal* Crops	Other Improved** Farmland	Unimproved Farmland		
1870	35.9	30.3	37.2	174,041	17,995,839
1880	35.8	27.1	29.8	213,542	19,795,343
1890	38.2	24.2	24.4	211,557	18,363,148
1900	35.1	23.9	27.5	224,248	19,375,027
1910	34.7	23.1	27.0	219,295	18,596,216
1920	37.6	21.0	28.7	202,250	17,657,513
1925	35.2	15.3	30.8	200,443	16,296,468
1930	34.4	21.2	33.2	172,419	15,309,485

* Includes corn, wheat, oats, barley, rye, buckwheat, potatoes, tobacco, and tame hay.
 ** Improved land includes crop land and plowable pastureland.

where the average is 156 acres.

In the southeastern part of the State, the level topography, rich soil and nearness to market, resulting in an intensive agriculture, is responsible for small farms. The farms in the Allegheny Mountain region, compared to the southeastern area, are much larger because of the excessive waste land, considerable wood land, and a less intensive agriculture.

The size of farms in the different sections of Pennsylvania is continually changing. The average size in some areas is increasing and in others decreasing. These changes are the result of inevitable readjustments resulting from unstable population, industry and economic welfare of the people in each section.

Most of the counties showed increases or decreases in the average size of farms between 1920 and 1930, in the Census of 1930. The outstanding increases occurred in the north central counties and Lehigh and Northampton Counties. These changes indicate larger farming units with a more extensive agriculture. The outstanding decreases were in Pike and Fayette Counties. The development of Pike County as a resort and sports region, along with considerable farm abandonment, probably was responsible for the large decrease in size of farms. Fayette was the only county in the State to record an increase in farms from 1920 to 1930. In the same period, there was a decrease of 14 per cent in that county in the average size of farms. This was due possibly to an increasing number of small self-

sufficing or part-time farms.

Total Acres in Farm Land. As the number of farms and the average size of farms have decreased, it naturally follows that the total number of acres in farms also has been decreasing. From 1900 to 1930 there has been a loss of 4,065,542 acres of farm land. This means a yearly loss of 135,518 acres. The rate of loss has been much greater since 1920 than before, which shows the rate of farm abandonment is accelerating. Some of this loss has been absorbed by expansion of urban centers, estates, airports and other similar developments. Much of the loss has occurred in the poorer farming areas and this has probably been due largely to unprofitable operations.

TREND IN CROP AND LIVESTOCK PRODUCTION

Although the longtime trend in Pennsylvania is toward less land devoted to agriculture, the net farm production in this State has been increasing. More intensive farming and greater efficiency enables the farmers to produce more on less land. A few figures will be sufficient to show the typical changes.

Changes in Crop Acreages. The acreage planted to the nine principal field crops in Pennsylvania has decreased 17 per cent since 1900. There was a 478 per cent increase in the acreage of barley and an increase of 128 per cent in tobacco acreage. The acreage of the other seven crops shown in the table on acreage in field crops decreased anywhere from 4 to 60 per cent. The substitution of barley for wheat and rye as a livestock feed probably accounted for the large increase in the acreage

Change in Acreage of Fields Crops in Pennsylvania Since 1900.*

Crop	Average Acreage (in thousands)		Per Cent Change
	1896-1904	1929-1932	
Corn	1,353	1,263	-7
Wheat	1,517	976	-36
Oats	1,192	964	-19
Barley	9	52	+478
Rye	319	128	-60
Buckwheat	243	166	-32
Potatoes	210	202	-4
Tobacco	18	41	+128
Tame Hay	2,787	2,562	-8
Total	7,648	6,354	-17

*General Bulletin 445 and Pennsylvania Crop and Livestock Report. Pennsylvania Department of Agriculture.

Change in Yield per Acre of Important Field
Crops in Pennsylvania from 1886-95 to 1924-33*

Crop	Average 10-year yield per acre		Per cent Change
	1886-1895	1924-1933	
Corn bu.	30.4	39.1	+29
Wheat "	13.6	18.6	+37
Oats "	25.7	31.3	+22
Barley "	19.6	26.1	+33
Rye "	12.6	15.3	+21
Buckwheat bu.	14.7	18.7	+27
Potatoes "	73.5	117.5	+60
Tobacco lbs.	1182.4	1235.5	+4
Tame hay tons	1.2	1.4	+17

* General Bulletin 445 and Pennsylvania Crop and Livestock Report. Pennsylvania Department of Agriculture.

of this crop.

The significant change in apple trees has not been in the number but in the rapid change from small home orchards to commercial plantings with an outstanding increase in yield. The number of peach trees in Pennsylvania was about three and one-half million in 1930. Since 1900 the number of trees has not changed materially but yields have increased because of better orchard management.

Much of the increased agricultural production in Pennsylvania has been in the vegetable business. There was a 36 per cent increase in the acreage of the 11 most important vegetables from 1900 to 1930.

Yield Per Acre. The yield per acre of all field crops had increased since the latter part of the nineteenth century. One of the accompanying tables shows 10-year average yields of crops for two periods about 40 years apart. The yield per acre of every crop has increased, the most outstanding being a 60 per cent increase in the average potato yield. Tobacco, with only a 4 per cent increase, is the only one of the nine principal crops not having at least a 17 per cent increase.

The principal reasons for these higher yields are the abandonment of some of the poorer land, use of better strains and varieties, improved cultural practices, and better control of insects and diseases.

Livestock Production. The number of different types of livestock has changed materially between 1900 and 1929. Milk cows

Number of Livestock on Farms in 1900 and 1929
and Per Cent Change.*

	<u>Number of Head (in thousands)</u>		<u>Per Cent Change</u>
	<u>1900</u>	<u>1929</u>	
Horses	560	349	-38
Mules	38	51	+34
Horses and Mules	598	400	-33
Milk Cows	970	855	-12
Other Cattle	524	530	+1
Swine	1064	715	-33
Sheep	814	441	-46
Poultry	10,025	19,034	+90

* General Bulletin 445 and Pennsylvania Crop and Livestock Report. Pennsylvania Department of Agriculture.

decreased 12 per cent in number but the estimated amount of milk produced was 9 per cent greater in 1929 than in 1900. This shows a much higher production per cow than formerly. The number of poultry on farms increased from around 10 million to 19 million, or a 90 per cent increase. According to estimates, the production per hen has increased 12 per cent during the same period. This would mean an increase of over 100 per cent in total egg production in the State.

The decreasing importance of sheep and hog raising and the effect of western competition is indicated by a decline of 33 per cent in the number of hogs on farms and a 46 per cent decline in the number of sheep. The number of other cattle, which are kept mainly for beef purposes, have remained practically the same.

The number of work animals has decreased 33 per cent, there being a 38 per cent decrease in the number of horses and an increase of 34 per cent in the number of mules on farms in Pennsylvania. The increased use of the truck and tractor has in part been responsible for the decrease in the number of work animals.

AGRICULTURAL LAND-USE PROBLEMS

There are three major agricultural land-use problems in Pennsylvania which should be studied to properly plan any land utilization or readjustment program. They are: soil erosion, abandoned farm land and submarginal farm land now under cultivation. In the past most of the research and extension

work has been in the better farming areas. This is to be expected because of the better interest and ability to adopt new methods. Progress has naturally been greatest in the better areas. As a result, the increased competition has caused greater maladjustment in the marginal and submarginal farms. There is a need for more land-use studies, especially in the more serious problem areas.

SOIL EROSION IN PENNSYLVANIA*

There are two types of erosion. One is called "gully erosion," since it results in the formation of gullies. The other, which removes soil a layer at a time over a large area, is called "sheet erosion." The gully type is the more noticeable of the two. It converts fertile land into a barren waste by cutting up fields to such an extent that profitable cultivation is impossible. Sheet erosion is not as evident as gully erosion but it removes tons and tons of fertile top soil each year. It does not prevent cultivation but gradually, as the top soil is lost, the field becomes less and less productive. This condition often is blamed on something other than the real cause. Many farm operators whose land is being removed by sheet erosion do not realize what is going on.

Sheet erosion is the type that prevails in Pennsylvania. Small gullies are quite common but, except where sheet erosion is well advanced, gullies are scattered and rather shallow.

A recent Reconnaissance Erosion Survey of Pennsylvania

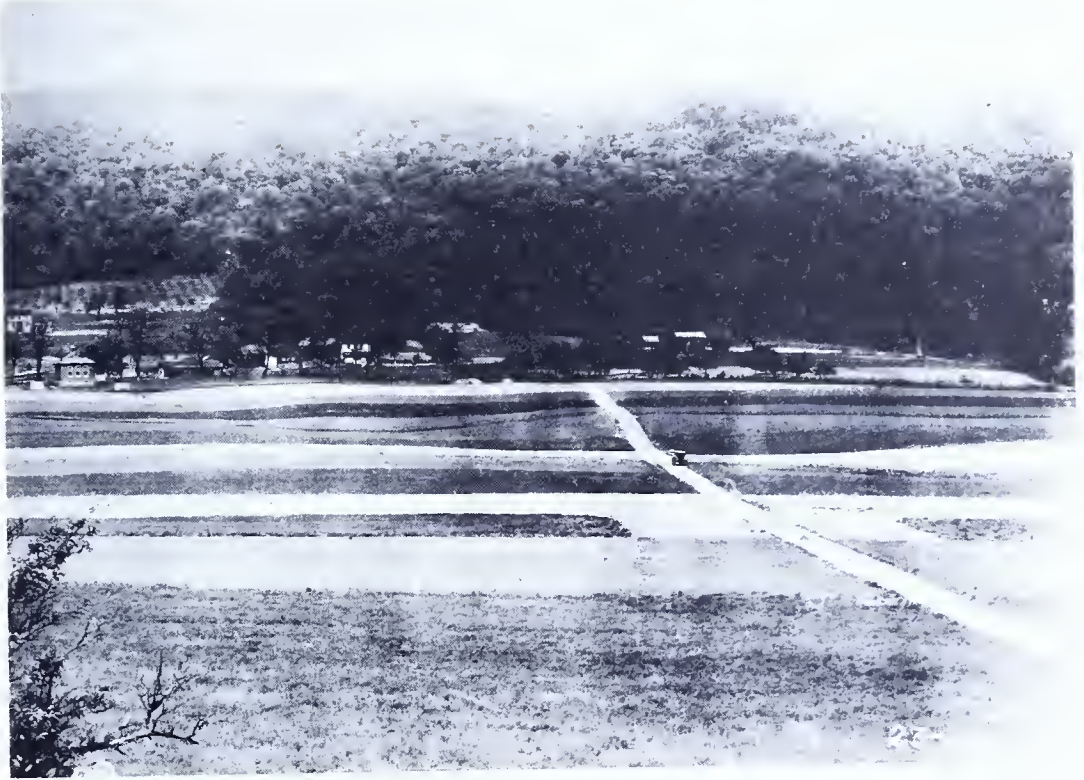
*Austin L. Patrick, Soil Technologist, Pennsylvania State College

shows that from 25 to 75 per cent of the surface soil of Pennsylvania has been lost by sheet erosion where the land has been cleared and cultivated. This means that approximately 50 per cent of the top soil has been lost since the land has been under cultivation which, on an average, is not more than 100 years. At this rate the entire surface soil of Pennsylvania would be removed in another century of cultivation.

After a few inches of the surface have been removed, the underlying soil is lost at an exceedingly rapid rate. Many persons do not realize that practically all of the available plant food constituents are found in the first 6 inches of soil. Here the organic matter, consisting of plant and animal remains, is found. The uninitiated might suggest that organic matter and plant food elements could be added to the raw subsoil and so convert this horizon into productive soil. The problem cannot be solved as readily as this, for several reasons. To attempt to restore the plant food constituents and organic supplies in the soil would be economically impossible. Even though it were practical to supply the organic matter in sufficient quantities to make up for the losses by erosion it would be impossible to cover each soil grain with a thin organic film, as nature does; this requires many years. This film-like distribution of organic matter is largely responsible for the excellent physical quality of virgin soils. It helps in moisture retention and prevents excessive plasticity and cohesiveness.



Seventy-five years ago this waste land in
Stone Valley was a fertile corn field.



An excellent example of a strip crop system of farming to prevent soil erosion, worked out and put into effect by "Master Farmer" Ray Brown in the Kishacoquillas Valley.

The difference in crop producing ability between surface soil and subsoil is noticeable where clean cultivated crops are grown. The yellow or red spots, which indicate the subsoil, are evident even on nearly level land. These subsoil spots seldom produce as good crops as the surface soil. The difference between the two is even more marked during periods of drought. Some subsoils are much more productive than others but no subsoil will produce corn, potatoes and many other crops comparable with productive or normal surface soils unless large amounts of commercial fertilizers and organic matter are added.

Soil erosion in Pennsylvania is influenced by a number of interrelated factors. In discussing these it is necessary to treat each as a unit but it must be remembered that one factor influences the operation of another. Aside from climate, the factors which regulate the amount of soil and water run-off are nature of cover, per cent and length of slope, amount of organic matter, filled top soil and soil type.

A comparison of a cover map, type of farming map and the general erosion map of Pennsylvania shows a number of interesting correlations. There is practically no erosion in timberland, except here and there where the litter has been removed by man or animals. Old skid trails or ruts made by wagons or paths often act as the beginning of gullies in the forest. On cleared lands, very little erosion takes place where the land is in continuous sod. Where the sod becomes weedy and thin, where paths are worn, or where wagons have caused ruts, erosion

often is serious. Fertilizer and lime may often work wonders in erosion prevention on run-down pastures and meadows.

The most important live stock sections of Pennsylvania are not badly eroded. The outstanding exception to this is the large live stock section in southwestern Pennsylvania. Most of the land there is in grass, yet the prevailing system of farming calls for plowing the grass when the turf becomes thin. Corn usually follows the grass; being a clean cultivated crop, losses of soil by erosion are excessive. Even though this land is plowed only once or twice every ten or twelve years, erosion is serious because of the nature of the soil and the sharpness of the prevailing slopes.

In the dairy sections of northern Pennsylvania erosion is not such a serious problem as in most other sections. The slopes are not as abrupt and hill-sides are covered continuously with grass, only a small acreage being devoted to the growing of clean cultivated crops. The large stone content also tends to impede losses of water and soil. The land which is used the most for growing clean cultivated crops is the land on which erosion is the greatest problem. Since nearly all crops in Pennsylvania are grown in rotations the short rotations are the least desirable and predominate in the general farm sections. Bulletin 305 of the Pennsylvania Agricultural Experiment Station entitled "Types of Farming in Pennsylvania" contains a map which shows the type of farming areas in 1929. It presents a good erosion picture of the State.



The beginning of a gully on an Indiana
County Farm.



Small gullies and sheet erosion in northern Indiana County.



An excellent method of erosion control put into effect on an Indiana County Farm.

Cultivated steep slopes wash more readily than flatter areas. In fact, on nearly every farm there are some areas which are so flat that a minimum amount of erosion takes place, while the adjacent slopes may be ruined for cropping purposes. Subsoil often is exposed in cropped land where the slope does not exceed 3 or 4 per cent. In general, the steeper the slope the greater the erosion, other factors being equal.

Certain soil types erode much more readily than others. The old Reconnaissance Soil Survey of Pennsylvania recently was brought up to date and new maps are being prepared. In general, the thinnest soils are those which developed from thin, platy argillaceous shale, schists or from combinations of calcareous and argillaceous shale. Examples of the former are the Calvin, Berks and Dutchess soil series. The latter are exemplified by the Meigs, Belmont, Upshur and Westmoreland soils. The Manor soils represent the main soil derived from schist. There are 58 different soil series recognized on the Reconnaissance Survey and 121 different types.

The Pennsylvania State College has been cooperating with the Bureau of Chemistry and Soils of the United States Department of Agriculture for twenty years in mapping the soils of Pennsylvania. At present, approximately one-third of the State is mapped. This work is fundamental to the whole land-use program and should be completed as soon as possible. The soil maps would be more useful if soil erosion, per cent of slope and land-use features were included, as well as soils. The

Soil Erosion Service has shown, during the summer of 1934, that all of these features can be shown on the same map without much more work than is required to map soils or erosion alone.

Farmers in many sections of Pennsylvania practice soil erosion control measures to some extent. Some of the more common means are strip cropping, planting trees, leaving permanent grass depressions where gullies might form, and permanent grass for pasture. Mechanical means of control, other than contour plowing, are seldom used.

The erosion studies that are being made in Pennsylvania at present consist of three phases:

(A) Surveys

To show types, location and extent of soil erosion as related to nature of cover, per cent of slope, and soil type. The plan is to make a general or reconnaissance survey, to be supplemented by many scattered detail surveys or limited acreage made here and there throughout the state. Strip surveys across the state have also been planned.

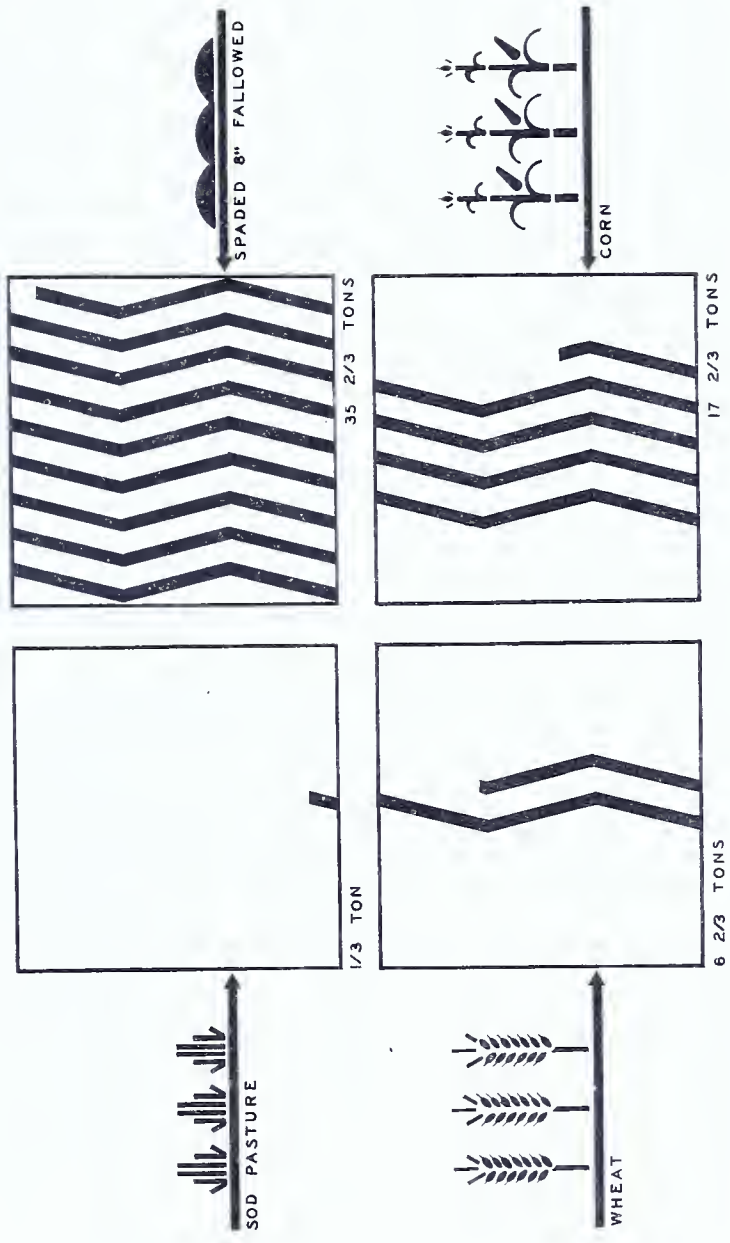
(B) Control Demonstrations

Many plots, to illustrate the more desirable methods of control under cropping, permanent pasture, and orchard management practices. In addition, studies are being made which will aid in the selection of trees for timber control.

(C) Watershed Demonstrations

The aim is to put into practice the most effective measures of control known on a complete watershed.

The above program is being carried out by the Soil Erosion Service of the United States Department of the Interior. The



EROSION OF FIELDS IN ONE YEAR
UNDER DIFFERENT METHODS OF CULTIVATION
ESTIMATED

field work for the Reconnaissance Survey of the State has been completed and several detailed area surveys are available. The semi-experimental or control demonstration plots are being set up on land belonging to The Pennsylvania State College. A Watershed Demonstrational Area has been selected north of the town of Indiana. It consists of about 130,000 acres and includes about 800 farms. The sum of \$200,000 was set aside for this purpose by the Secretary of the Interior on October 5, 1934.

This report points out the extent of soil erosion in Pennsylvania and how it is affected by various conditions, including percentage of slope, nature of cover, and soil type; and the work that is being done by the Soil Erosion Service. The State should be made conscious of the seriousness of the situation. Erosion control is too large an undertaking for the average land owner to accomplish unaided. Thousands of acres of land in Pennsylvania already have become unprofitable for agriculture through erosion. Thousands of acres more fall into that class each year. It is time that the Federal and State Governments began to work with this problem; if erosion is not controlled, it will result in untold losses.

ABANDONED FARM LAND

A problem which has raised considerable comment and about which little is known is the extent of farm abandonment in Pennsylvania. Anyone who has traveled through the State cannot help but wonder at the vast amount of idle land and the reason

for this condition.

Farm abandonment is primarily due to cultivating land from which a satisfactory living cannot be derived. There undoubtedly would be many more farms abandoned if it were not for a reluctance to move away from property accumulated through years of hard work and start life anew in a different environment.

From 1900 to 1930 there was a decrease of 51,829 farms and a decrease in the same period of 4,065,542 acres in farm land within the State. Not all of this former farm land is idle at present. Much has been naturally reforested, purchased by the State, or used for real estate development.

A survey made in the winter of 1925-1926 in 15 counties of central and south central Pennsylvania indicated between 1,600 and 1,700 separate tracts of land, or about 145,000 acres that had not been operated during the previous two years.* The study also indicated about two-thirds of this acreage had been abandoned for the five previous years. A State-wide survey in the summer of 1926 indicated approximately 105,000 acres of abandoned farm land in the same 15 counties which checks very closely with the previous study.*

In 1928 the Pennsylvania Department of Forests and Waters made a survey in 17 counties to determine the amount of idle cleared land in these areas. The total was 232,315 acres, approximately half of the total loss in these counties of non-

* General Bulletin 445, Pennsylvania Department of Agriculture.

wood land farm area from 1910 to 1930. Using the results of the study as a basis, it was estimated that approximately 1,200,000 acres of idle cleared land existed in Pennsylvania at that time. This is 7.3 per cent of all cleared land in farms in the State.

The results indicated that a much larger percentage of the loss in non-wood land farm area was idle in the poorer farming areas than in the more productive areas.

In some counties as high as 20 to 25 per cent of the farms were abandoned by 1929. At that time few of the houses on those farms were occupied but in 1934 practically every house was being used. Until the depression, the trend of population was toward urban centers. This trend has changed in some sections. A comparison of 1929 and 1934 population figures shows four of the poorer farming counties had an increase of 4 per cent in the third and fourth class school districts. During the same period the population in the third and fourth class school districts in four of the better farming counties remained practically the same.

Do these people who are moving to the poorer farming areas and occupying abandoned farm houses expect to invest in a farm only to find in a few years that it doesn't pay and leave as the former occupant has done? To what extent are they paying taxes and supporting the community? To what extent do they add to the poor relief load in these counties?

It is highly desirable at present to know the exact con-

Amount of Cleared Land* and Per Cent of

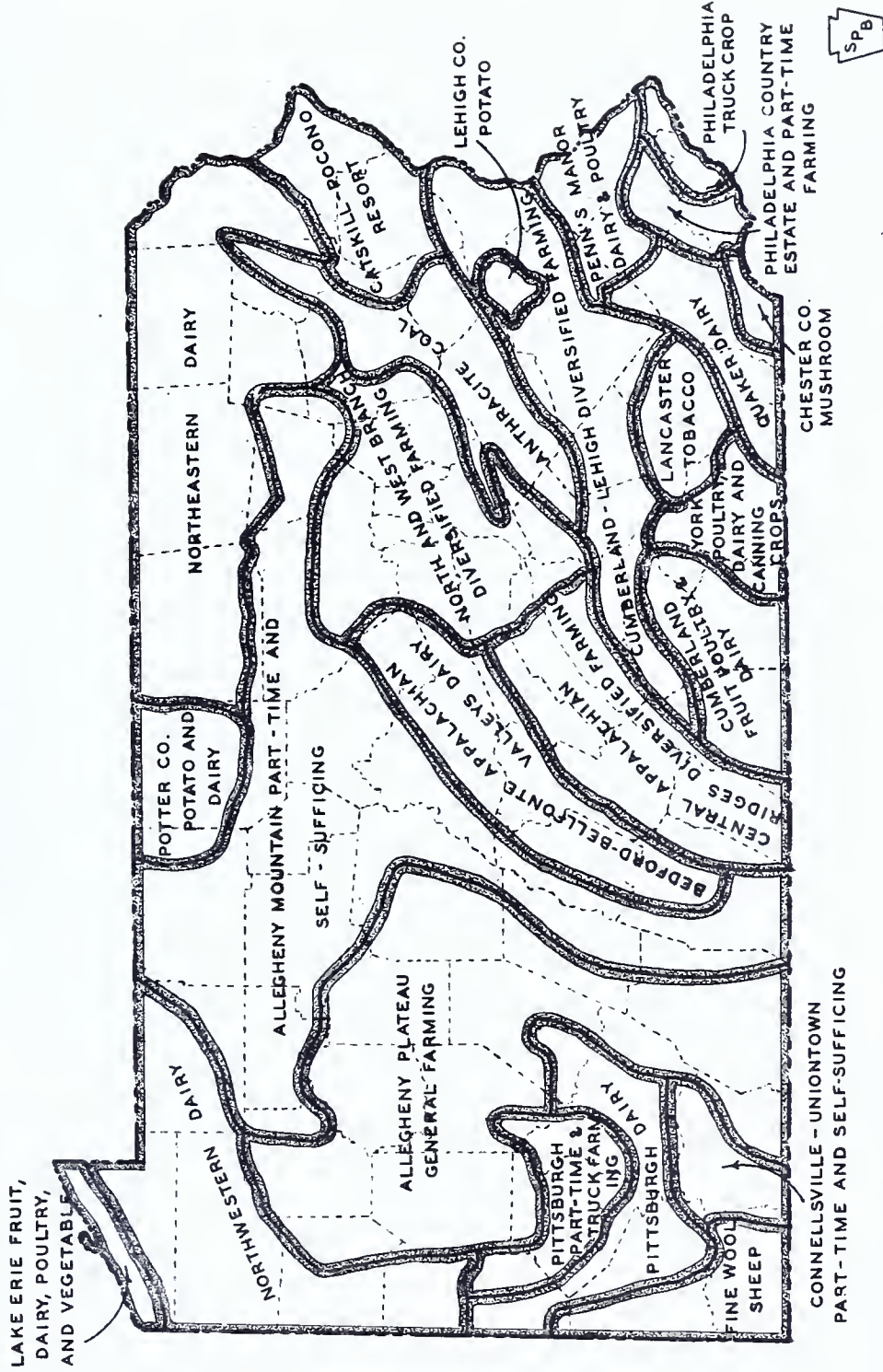
Total Cleared Land Area Idle in Seventeen Counties, 1932

County	Loss in Non-Woodland Farm Area 1910-1930**	Total of Idle Cleared Land	Per Cent of Total Cleared Land Idle
Adams	17,422 acres	5,855 acres	2.2
Carbon	15,994	4,717	6.2
Centre	24,811	15,390	5.8
Clinton	9,982	12,244	11.6
Crawford	67,875	31,902	6.0
Elk	9,981	8,600	11.4
Franklin	14,411	8,393	2.4
Greene	24,953	12,135	3.6
Juniata	15,317	8,990	6.0
Lawrence	27,500	17,047	9.4
Monroe	29,140	24,767	15.5
Potter	55,498	23,470	9.1
Somerset	58,350	21,010	4.9
Sullivan	9,258	10,770	11.7
Susquehanna	46,271	13,605	3.2
Union	6,356	4,000	4.1
York	<u>38,642</u>	<u>9,420</u>	<u>1.9</u>
Total	471,761	232,315	5.4
Estimate for State	2,359,223	1,200,000	7.3

*Bulletin 51, Pennsylvania Department of Forests and Waters

**United States Census

TYPES OF FARMING AREAS



SPB

FIGURE NO. 39

dition of these idle lands in regard to their tax and debt situation. Are they still a source of tax income? How has abandonment of some farms affected the costs of schools and road maintenance for those that remain? Is the amount of State aid going into these sparsely settled areas justified or should it be curtailed? Would not the total of State aid over a few years in some sections be enough to buy all the land and turn it into a self-liquidating forest project? Would this solve the problem of a living and educational opportunity for the present occupants?

These areas of idle land constitute a real land utilization problem. Two agencies in Pennsylvania have instituted definite programs for better use of large areas of abandoned land. They are the State Department of Forests and Waters and the State Game Commission. Their future program would possibly absorb all of the idle farm land, but many small tracts are unsuitable for their purposes. Complete adjustment cannot result from the work of the above agencies alone.

SUBMARGINAL FARM LAND

The term submarginal farm land as used in this report refers to land so low in productivity and value of products sold per acre that arable farming is uneconomic and undesirable. It is land from which a satisfactory living cannot be derived over a period of normal years. There is no clear cut division between a marginal and a submarginal farm. A slight change in the price of farm products may change the classification of

many farms.

The fact that both the number of farms and the number of acres in farm land has been steadily decreasing in large numbers since 1900 indicates a trend of conditions which is rendering these farms unprofitable. Even the high prices of farm products during the war period did not stop the trend of farm abandonment. The increased use of machinery under high prices probably intensified the unfitness of many areas that formerly supported farm people. Without definite standards for judgment and detailed studies it is almost impossible to say which farms are submarginal and how many exist. Although it is probable that many unprofitable farms are being operated at present, the social welfare of the people living on these areas should not be overlooked.

Reliable information for locating the poorer farming areas in Pennsylvania is essential. To determine the value of land for agricultural purposes two important factors must be considered. One is cost of production, influenced largely by yields; the other the cost of marketing. An attempt has been made to make a preliminary estimate of the number of submarginal farms in the State. As a basis for determining the more serious areas, a weighted index number of crop production per acre and index number of value of products per acre for Pennsylvania, each by minor civil divisions, was used*. The power areas

* Obtained from a Study of Economic Land Classification in Pennsylvania which is now being made by the Department of Agricultural Economics, the Pennsylvania State College.

SUBMARGINAL FARM AREAS BY TOWNSHIPS

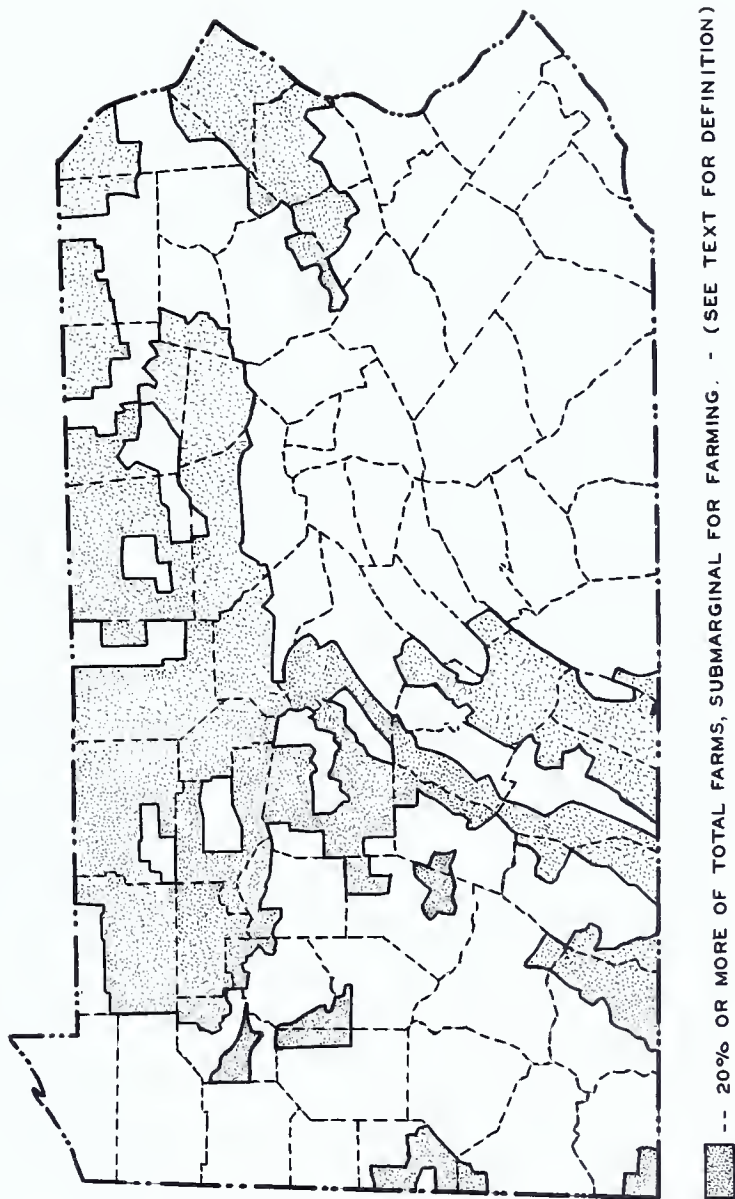


FIGURE NO. 40

were mapped from these indices and with the assistance of persons well informed in the various counties.

The results of the survey, completed in November, 1934, are shown in an accompanying figure. The shaded areas are townships where 20 per cent or more of the farms under cultivation are estimated to be submarginal. These shaded townships are considered a distinct problem land-use area. The general location of these areas is in the northern counties and the south central section along the Appalachian Mountains, where the soil, topography and climatic conditions are less favorable to agricultural production.

It is estimated from this preliminary survey that slightly more than 10,000 farms within the designated problem areas are submarginal. This is about 6.5 per cent of all farms in the State and 40 per cent of all the farms in the problem areas. Approximately 1,133,000 acres are included in these submarginal farms. Of the total, 357,000 acres are in crop land and 403,000 in pasture land. It has been estimated that there are about 120,000 acres of submarginal farm land not included in the above problem area. This would make a total of approximately 1,250,000 acres of such land in the State, or slightly more than 8 per cent of the total land area in farms in 1930.

Reliable estimates place the value of the land and buildings per acre on the submarginal farm land at \$20.80. These estimates were inclined to be higher than actual sales indicated. The section with lowest valuation was the

Appalachian Mountain region in central and south central Pennsylvania, which was \$14.80 per acre. In the Pocono Mountain resort section in northeastern Pennsylvania, the value was estimated at \$53 per acre. This is too high for agricultural purposes but the area is a popular hunting and resort section, which keeps the value of land very high.

Tax Delinquency. Since 1929 current tax delinquency has not in all cases been most serious in the poorer farming areas. Farmers who had large cash incomes were affected more by the sudden drop in prices than the farmers with low incomes. For this reason, current tax delinquency is not a very good indication of poor farm land or submarginal conditions.

A better indication of the net returns from farming is the amount of continued tax delinquency. Data was obtained from the County Treasurers' books in several counties on the number of farms on which the 1931 and 1932 taxes were not paid on August 1, 1934, at which time such farms were to be put up for sale.

With one exception the problem areas had a much higher percentage of tax delinquency than the non-problem areas. In McKean County it was almost five times as great. Venango County showed a very high percentage of delinquency, 18 per cent for the non-problem area and 34 per cent for the problem area. The 1932 figures show an enormous increase in delinquency over 1931 for McKean and Susquehanna Counties, the only counties for which the later figures were obtained.

Per Cent of 1931 and 1932 County Taxes

on Farms Delinquent August 1, 1934

County	Non-Problem Area			Problem Area		
	Number of Farms 1930 Census	Per Cent 1931	Delinquent 1932	Number of Farms 1930 Census	Per Cent 1931	Delinquent 1932
McKean	191	4	10	890	19	25
Susquehanna	2030	2	15	1140	2	18
Warren	902	10		1090	22	
Venango	1132	18		638	34	.

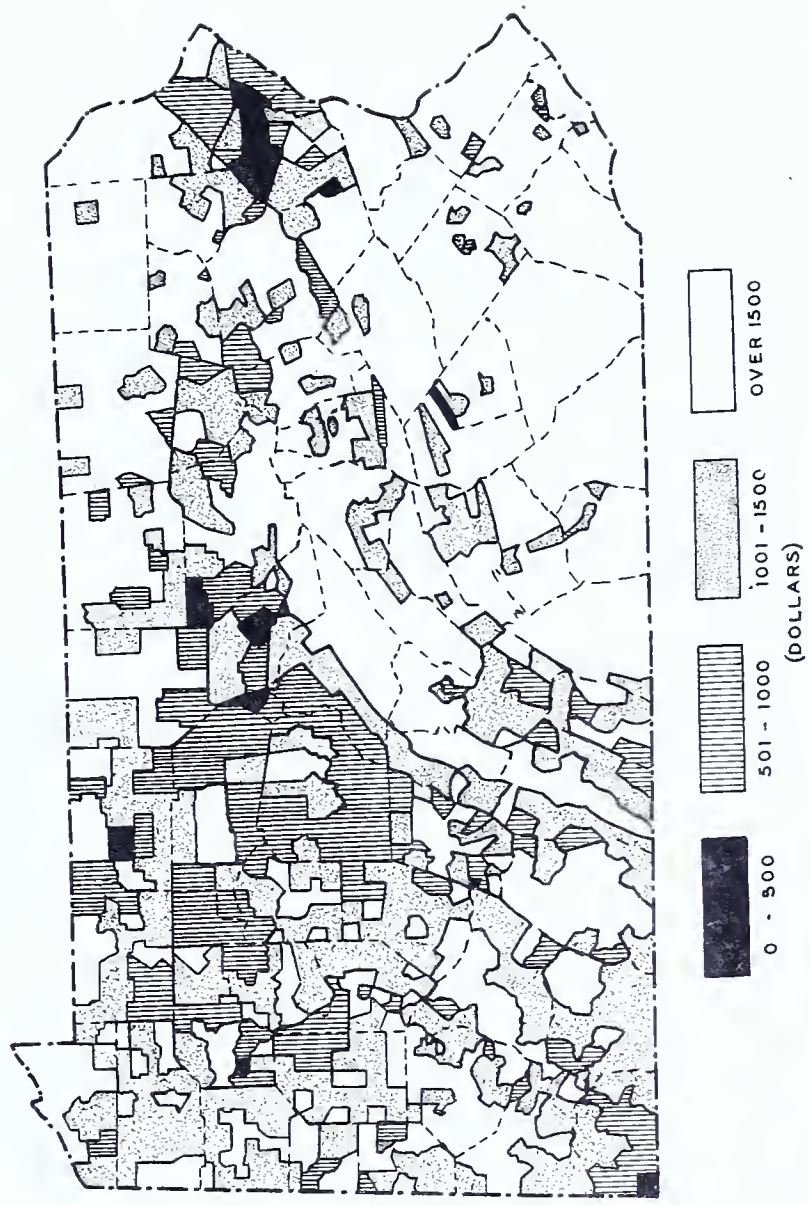
Incomes. The average farm income by townships worked out from the 1930 census figures is shown in an accompanying map. This is not a true picture of the value of the land for agricultural purposes but it does show distinct areas of high and low incomes. The southeastern area stands out clearly as having high farm incomes. The areas of low income per farm correspond closely to the problem area map where 20 per cent or more of the farms are considered submarginal. The Pocono Mountain resort section, and the central and south central sections show exceptionally low incomes per farm. These areas would show a much lower income if it were not for a few of the better farms raising the average. The area in Susquehanna and northern Wayne Counties have high average incomes for problem areas. This is due to the fact that dairying was very profitable the year the census was taken.

Population Decline. The trend of population within Pennsylvania from 1900 to 1929 was usually away from the poor farming areas. Most of the counties showing a decrease contain large areas of submarginal and abandoned farm land. The principal areas where population has declined is in the northern counties east of McKean, where the people are mostly rural. Potter County had a 42.9 per cent decrease between 1910 and 1930, Tioga - 35.1, and Sullivan - 38.2 per cent decrease. These losses have probably been at the expense of the rural population. The per cent of abandonment in these counties is estimated to be very great. Little information is known con-

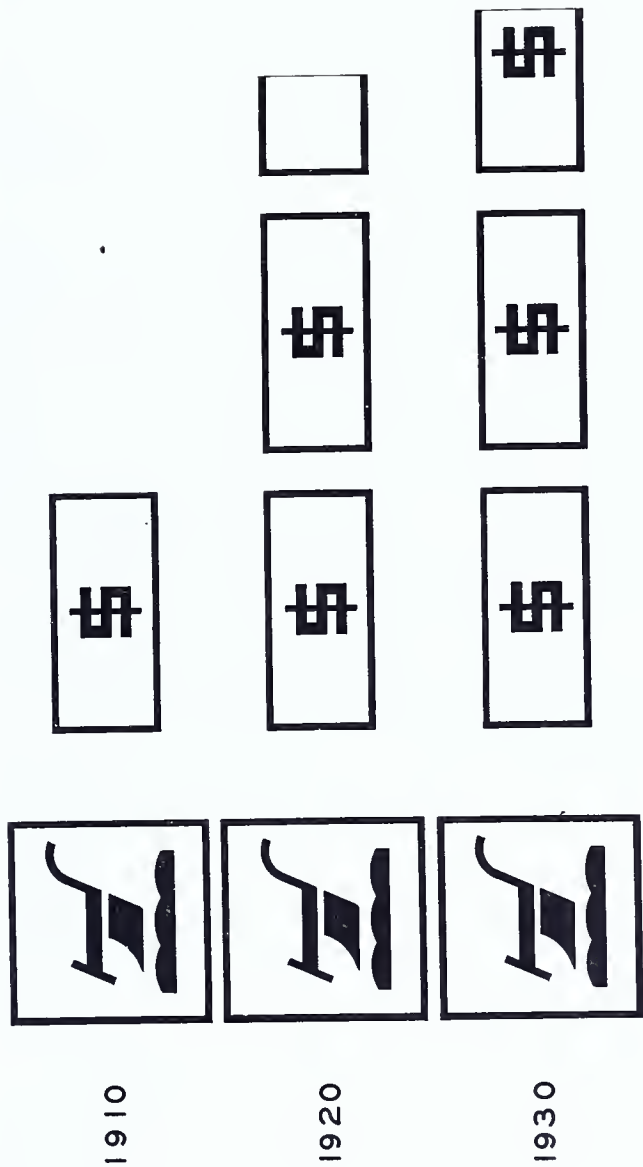
VALUE OF FARM PRODUCTS

AVERAGE BY TOWNSHIPS • 1929

INCLUDES PRODUCTS SOLD, TRADED & CONSUMED ON THE FARM



SpB



INVESTMENT PER ACRE
IN FARM MACHINERY



FIGURE NO. 42

cerning the effect of this emigration on fiscal conditions and social life in these areas.

Factors Responsible for Submarginal Farms and Farm Abandonment.

The fact that the farm land in Pennsylvania has been decreasing at the rate of 135,000 acres annually for the past 30 years is conclusive evidence that some sound social and economic factors have been responsible. It is hard to say how long this trend will continue.

Increasing Cost of Production. In the past twenty years there has been a decided increase in the cost of production on Pennsylvania farms. From 1910 to 1930 taxes on farm real estate increased 159 per cent, farm mortgage indebtedness 85 per cent, and the investment in machinery and implements per acre 165 per cent. While these steady increases in costs were taking place, prices of farm products in this State advanced only 47 per cent. Farm prices did not advance nearly as much as the major costs of production. This more extensive farm equipment can be used, with profit, only on the better land.

A study* of taxation in Pennsylvania in 1925 indicated that 13.6 per cent of the gross income of farm people was required to pay their taxes that year while only 9.5 per cent of the income of all other people went for the same purpose. In the same study it was found that 38 per cent of the net income of farms and mining corporations was required to pay

* F. P. Weaver, Pennsylvania Agricultural Experiment Station
Bulletin 263

their taxes. These are the types of businesses that require large investments in real estate. Other types of businesses requiring limited investments in property paid only 13 to 27 per cent of their net income for taxes. These figures indicate the unjust tax burden that is placed on farm real estate.

Early in 1933 a survey* of 53 counties indicated that approximately 139,996 acres of cleared land had reverted to county ownership, no bids being made for the amount of the delinquent taxes. This condition may not have existed if more equitable tax assessments had been.

Competition from Other Areas. Improvements in agricultural production and in marketing have been the cause of considerable maladjustments in many eastern farming areas. Before mechanical power was used there was not much difference in the efficiency of farming anywhere in the United States. The specialized producing areas in the west are well adapted to large scale mechanized farming while certain sections of Pennsylvania, with its rough topography, are not. For this reason some Pennsylvania farmers have found it difficult to compete with areas of more level topography.

Along with specialized production came improvements in transportation. In 1933 Wisconsin supplied 31 per cent of the cream receipts in the Philadelphia market. In the same year only 10 per cent of the egg receipts in that market were sup-

* Pennsylvania Department of Forests and Waters



1910



100



100



1933

90



78



78



100



218

TAX DOLLARS

INCOME DOLLARS

THE FARMER'S DOLLAR



PLANNING
BOARD

FIGURE NO. 43

plied by Pennsylvania farms. Most of the eggs consumed in our eastern markets are produced in the mid-western states. Low cost of production and adequate transportation facilities enable them to successfully compete in our markets. These conditions are tending to make farming less profitable on the poorer farm land in this State. Farming, especially for crop production, will have a tendency to concentrate in the more level areas. Large areas of marginal land in the west are still undeveloped. This fact indicates that abandoned and sub-marginal farm land in Pennsylvania probably will not be needed in the future for agricultural production.

Depletion of Soil Fertility. Loss of soil fertility is occurring in Pennsylvania in two principal ways, by soil erosion and by removing plant food by crop removal without restoring this fertility. The loss by soil erosion has been adequately discussed already in another section of this paper. Information on loss of fertility by crop removal is not available. Tests of lime requirements indicate that many of the farms, especially in the northern counties, are becoming more acid.

When the farming area of Pennsylvania was still increasing, larger areas of cut-over land were put under the plow. Prices of farm products were relatively high, competition from other areas not oppressive, and the soil fairly productive. Under these conditions, farming was profitable.

As competition became more keen, these farms did not pay so well. Fertility of the soil and building repairs were

neglected. All of the income was needed to pay current expenses. As the fertility of the land decreased the returns also decreased. The inevitable result was tax delinquent sales and farm abandonment.

Other Factors. The disappearance of local markets in some areas is also an important factor in the welfare of nearby farmers. Decadent mining, and the disappearance of lumbering and manufacturing towns that once furnished good local markets for a limited number of farmers have, in many cases, resulted in submarginal conditions for farmers.

Supplemented income and employment in the lumbering business was at one time an important item for many farmers, especially in the central and northern sections of the State. The peak of lumber production was reached in 1900. Since then both farm land and the lumbering business have declined rapidly. Pennsylvania lumber production in 1930 was only about ten per cent of what it was in 1900.

In 1928 a land utilization study was made in Wyoming County to determine what factors made land submarginal for farming in the poorer areas of Pennsylvania.* The area studied is in the northeastern part of the State, some of it being in the problem area already referred to.

Accurate information of all operations was obtained on 50 selected farms and a record of land use and occupancy on 1,307

* P.I. Wrigley, Pennsylvania Agricultural Experiment Station Bulletin 257.

of the 1,543 farms reported in the 1920 census.

Although the study involved only a small number of farms for the short period of a year some definite recommendations and conclusions were made. Operating expenses are so nearly equal to returns that any unfavorable relationship between these items would have a tendency to increase farm abandonment. Consolidation of holdings should and will take place in the future to increase the efficiency of the farming unit. The smaller farming units are having the most difficulty. Volusia and Lordstown soils, which are unsuited for crop production, are usually submarginal for farming and should be abandoned in most cases. Approximately one-fifth of the county, an area of 50,000 acres, was recommended for forestry and recreational purposes as its best possible use. These areas lie chiefly in the southwestern and northwestern parts of the county.*

It is possible from this discussion of submarginal farm land to point out certain trends that probably will occur in the future. Land now out of cultivation or abandoned will not be needed again, for many years at least, for agricultural purposes. Operations on the poorer farm lands in Pennsylvania will tend to become less profitable. Decrease in farm acreage probably will continue. Problems of readjustment in land use will become greater. More research will be necessary to adequately cope with the situation.

*P. I. Wrigley, Pennsylvania Agricultural Experiment Station
Bulletin 257.

Studies in land utilization have been neglected in the past. The Wyoming County study has been mentioned. Early in 1932 the Greater Pennsylvania Council planned and started extensive land use studies but this organization was terminated before any satisfactory results were obtained. At present the Department of Agricultural Economics at The Pennsylvania State College is working on an economic land classification map of the State. This map is to classify land in Pennsylvania according to its value for agricultural purposes. This study will be of invaluable assistance in any future program of land use. More detailed study is needed covering also the social problems involved.

The large areas of submarginal farm land in Pennsylvania should eventually be put to their best possible use with the least amount of disturbance within our social structure. These lands probably should be retired from farming and devoted to forestry and recreational uses. Before any definite programs are started by either National, State, or other agencies, detailed studies should be made of both land and people in each area.

As H. A. Wallace, Secretary of Agriculture, stated before the American Civic Association in St. Louis, October 24, 1934, concerning land use planning, "We cannot move much faster than research makes the facts available, and we must not attempt to move faster than local public opinion will permit."

Index Numbers Showing Changes in Prices of Farm Products.
Farm Mortgage Indebtedness, Taxes on Farm Real Estate, and
Investment in Implements and Machinery Per Acre of Farmland
In Pennsylvania from 1910 to 1930.

Year	Prices of Farm Products	Mortgage Indebtedness	Real Estate Taxes	Investment in Machinery and Equipment.
1910	100	100	100	100
1920	218	145	163	244
1925	160	180	221	226
1930	147	185	259	265

Prices of Farm Products from Pennsylvania Agricultural Experiment Station Bulletin 309;
other from United States Department of Agriculture.

FOREST LAND AS A BASIC RESOURCE*

Forests have become valuable because of the multitude of wood products that civilized man has been able to extract from them, from construction timber to paper pulp and fuel wood. As accessible virgin timber supplies have been blotted out, nations have quickly discovered their dependence on wood and forest products, and have set about producing wood as a planned crop. Further, with the greater leisure for the masses of our people, the forest has become a playground. It is sought for the pleasures of hunting and fishing. Many citizens build in it summer homes and camps. It is used as sites for hotels and sanatoria. The forest is recognized as a conservator of rainfall and as a reservoir protection for domestic water supply and power use, as well as a regulator of stream flow.

Forest areas would be retained and developed as a public resource even if there were not a stick of timber coming from them. The certainty not only of self support but of their becoming the source of an important financial income from the wood produced as a raw material, improves their position as a capital resource subject to public planning and development.

Even though our industrial ingenuity is able to develop acceptable substitutes for many wood products, the cheapness

* Prepared by E. A. Ziegler, D. Sc., Director Forest Research Institute, Department of Forests and Waters, Mont Alto.

WOODED AREAS



PENNA. DEPARTMENT OF FORESTS & WATERS

FIGURE NO. 44

of producing wood and wood fiber, and the new uses for it constantly developing, will always keep it as one of our important raw materials. Wood has the advantage over coal, oil and gas for fuel, and over the metals for construction, in that it is a reproducible crop. If the forest lands are properly handled our wood supplies can be forever replenished, but the mineral fuels and many metals are subject to exhaustion. In the last analysis, we may have to fall back on the solar energy-storing abilities of our forests on a large scale for our increasing fuel and power demands. Already some European nations are requiring a certain percentage of wood alcohol to be used with gasoline for motor fuel.

Further, it is good public policy to keep large areas of lands in forests, for with no other profitable use these areas would soon deteriorate through erosion and injure adjacent agricultural lands as well as ruin our commercial waterways and water works of all kinds.

NECESSITY OF LONG TIME PLANNING

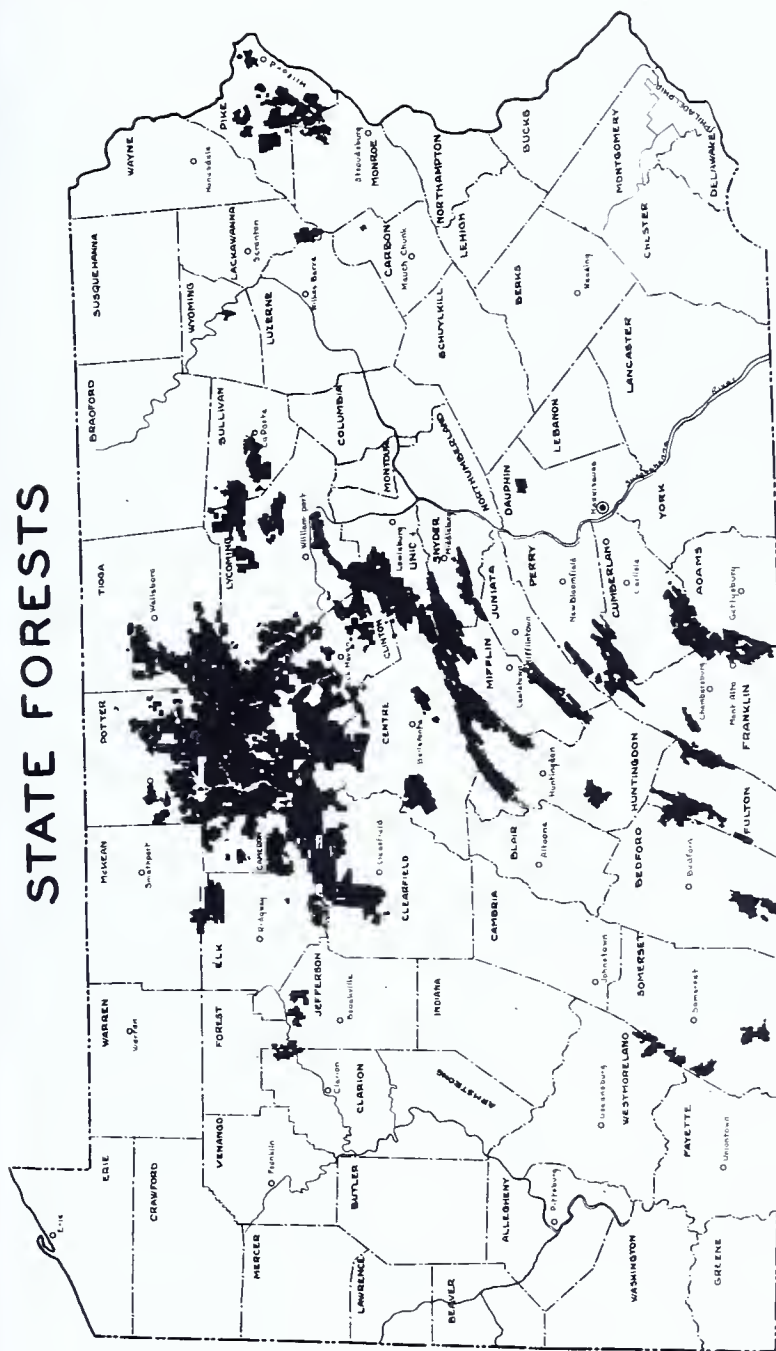
Forest trees develop more slowly than shade trees because of the smaller portion of light received by each tree, when many trees are on an acre of land. This crowding of forest trees is necessary to shade out the lower branches and produce long clean tree trunks of maximum lumber value. The soil where ornamental trees are placed is also generally enriched. Knotty trees are desired for practically no use - not even fire wood. Unlike shade and ornamental trees which

may grow an inch in diameter in one to two years, forest trees require three to five years to grow each inch in diameter, and generally require 30 to 40 years to grow small diameter wood materials like paper-wood, mine timbers and posts; 40 to 60 years to grow poles for wire lines or to grow railroad ties; and 50 to 100 or even more years to grow fine quality saw timber 12 to 30 inches in diameter. Rapidity of forest growth varies with timber species, rainfall and temperatures in different parts of our country, but within fixed limits.

Even though we still have some virgin high quality timber left in our Pacific Coast and Rocky Mountain forests which may be had at a reasonable price, including transportation to the eastern seaboard, this supply is strictly limited and will not remain plentiful to the end of the long period of years necessary to grow high grade timbers on our devastated forest lands in the East. It is essential, therefore, that we take forest planning more seriously, especially in the eastern half of the country where the great preponderance of our population resides and where our great lumber and wood markets are bound to continue.

This long time element is a great retarding factor for private forestry, and coupled with the expanding and dominant social benefits of forests, forms the chief reason for government ownership and management of forests on a large scale. Forests are pre-eminently fitted for investment and management by continuous organizations such as corporations using them

STATE FORESTS



PENNA. DEPARTMENT OF FORESTS & WATERS

FIGURE NO. 45

SPB

for raw material supply, or vital protection of water resources, and by the different branches of the government itself.

CONSUMPTION OF WOOD PRODUCTS

An examination of the consumption of wood products by some other nations of Europe and America shows that those nations are exporters of wood when the productive forest acreage exceeds one acre per capita, and importers when the national forest acreage is less than one acre. Their managed forest grows about 50 cubic feet or a little over a half cord of wood per acre a year, taking all classes of forest together. The colder nations grow less. Nations like Germany, France and Switzerland, with only .5 to .6 per acre of productive forest per capita must import a considerable part of the wood used. Poland is one of the few nations that export timber but have less than 1.0 acre of forest per inhabitant. This is accomplished through great self-denial in domestic wood use.

Although with central European standards of living and advanced forest management one acre of forest per inhabitant makes a nation self-supporting in wood and timber supply, our own American standards are much higher. We, in this State and Nation, require three to four times the wood volume per inhabitant that the front rank Central European nations do, despite the fact that we have a greater abundance of mineral fuels - coal, oil and gas. The United States with four acres

of forest land per capita is in a position to maintain this higher standard of living and high wood consumption, by intensifying its forest management, and doubling the wood grown per acre of forest. Pennsylvania with its less than 1.5 acres per capita will always consume more wood than it can grow, even with a slow growing or stationary population.

Comparison of Wood Grown, Consumed, and the Forest

Acreage per Inhabitant for a Number of Nations

<u>Country</u>	<u>Per Inhabitant</u>		
	<u>Wood Consumption or Drain</u> (cubic feet)	<u>Wood Growth</u> (cubic feet)	<u>Forest Area</u> (Acres)
<u>Wood exporting countries</u>			
Canada	285 plus	225	25.0
Finland	350	369	14.7
Sweden	265	197	9.9
United States	134	73	4.0
Norway	149	123	5.3
Russia (Europe)	70	127	3.7
Poland	23	31	0.9
<u>Wood importing countries</u>			
Switzerland	36	22	0.6
Germany	33	27	0.5
Belgium	30	11	0.2
France	27	23	0.6
Great Britain	21	1	0.1
Pennsylvania	89	39	1.4

Note - Canada's total commercial forest is not thought to be much over 250 million acres. The above figures on consumption apply to 1928-29, except for Canada, Sweden and Russia where they apply to an earlier year and may be relatively high for present consumption.

The authorities used are "A National Plan for American Forestry" - U. S. Forest Service; "Forest Resources of the World," Zon and Sparhawk; For Pennsylvania, The Pennsylvania Forest Research Institute Reports; "Forestry in Sweden," Perry.

RECREATION

The recreational use of the forest is an equal public service, and shortly may be recognized as even a greater one than supplying raw wood materials where population is as dense as in Pennsylvania. The greater leisure time of the people, the improved roads and the almost universal use of the automobile have made more and more distant areas of forest land accessible to larger portions of our population. Extensive forest areas are available or can be developed on otherwise idle and waste land in every part of the State. The recreational use of the forest may modify timber growing plans but is readily correlated with such plans.

HUNTING AND FISHING

A specialized phase of the use of land for recreation must be recognized in hunting and fishing. These uses of land in Europe, with the iron-clad development of property ownership and rights over them are generally made the subject of commercialized forest income. Private and even state owners of forest land and waters in Europe lease the exclusive hunting and fishing rights to the highest bidder and as a result, hunting and fishing recreation on forest lands are the prerogatives generally only of the wealthier class. The average man in Europe cannot hunt and fish. In America, with our long enjoyment of the open forest as a "commons" we have developed by custom the rights of the masses to hunt and fish on unenclosed lands as long as they do not injure the property.

This mass right to hunt and fish over adequate lands should be preserved to our people for all time through government ownership of such lands. Private forest lands are rapidly being secured and enclosed by private hunting and fishing clubs and the general public is excluded. This movement should be headed off by the extension of government forest land ownership.

Values involved for fishing are much less quantitatively than for hunting. Also the State Fish Commission seeks to keep open streams on private lands to public fishing, through stocking with game fish. It seems reasonably certain that public fishing rights will be preserved even in streams on private lands. Forest cover on fishing streams is important in maintaining clear waters at relatively low temperatures for such game fish as trout and bass. The fishing license method of financing State hatcheries and State stocking, together with limitation of the seasonal and daily catch of game fish, should bring back good fishing - provided the waters are kept pure and cool by foresting the maximum area on their watersheds.

The continued development of water reservoirs for power, domestic use and stream control will add to the fishing recreation of the State. Such artificial lakes as Wallenpau-pack, Pymatuning, the three dams on the lower Susquehanna, the dams on the Clarion and Monongahela, and the many smaller developments will be powerful aids in enhancing this popular

recreation. The policy of the State Department of Forests and Waters and Water and Power Resources Board, of reserving to the public maximum fishing, shooting and recreation rights on these lakes even when privately owned, is to be highly commended.

Considerable improvement in making streams on State forests and game lands favorable for fish life is possible by the building of artificial pools and improvement of stream channels.

COOPERATION IN USE OF FORESTS

Maximum benefits from large forest areas require close cooperation between technical foresters, seeking to perpetuate the needed timber supply, and the health and recreation interests, the hunters and sportsmen, the water conservation engineers and others. This is particularly true of government-owned forests.

A good example of this may be found in the Mont Alto State Forest in Franklin and Adams Counties. An area in the center of this forest, on a mountain plateau, has been set aside for the State Health Department's free tuberculosis sanatorium, where the health dividends of the forest are paramount.

Several watersheds are closed to camping for the protection of the water reservoirs which furnish the populations of Waynesboro, Mont Alto and the sanatorium with water. These watersheds will never be denuded or contaminated, and the forest springs held up even in such droughts as 1930 and 1931.

Mont Alto and Old Forge Park areas are set aside for public picnic grounds. Camp sites are leased for summer homes and camps. An area in this State forest is set aside as a game refuge, where the public is excluded in the hunting season. The entire forest outside this refuge is a public shooting ground. Camp sites are leased to hunters. The Fish Commission stocks the low temperature streams with trout.

With all these social services this forest is producing wood for local fuel and timber for wood-using industries. Between 1920 and 1928 there was sold, from this forest of 22,000 acres, over \$200,000 worth of wood (largely blighted chestnut) most of which went into wages for local labor. The original cost of this forest to the State was but \$77,000.

REDUCTION OF FOREST AREA

The United States once had about 820,000,000 acres of forest. This has been reduced by clearing for agriculture and by lumbering and repeated burning to less than 500,000,000 acres. Likewise Pennsylvania, which was once an almost unbroken forest of 28,000,000 acres, has had its forest growth reduced (largely by agricultural clearing) to 13,000,000* acres. In this reduced area are included several million acres of burned brush areas, hardly worthy of being called "forest." This reduction of forest area in Pennsylvania progressed so far on steep and inferior soils, that a strong

* Abandoned farms and other lands reverting to forest raise this figure to 14,533,292 acres.

counter movement of farm abandonment has set in. Already almost 1,500,000 acres of farms are in the abandoned class. Agricultural specialists believe that another 1,700,000 acres of still active farms will be found submarginal in the near future and should be transferred to forest, game and park use.

Present Land Use

		<u>Acres</u>
(1) <u>Forest Land</u>		
(a) Mature forest		694,492
(b) 2nd growth		5,800,455
(c) Restocking		1,464,682
(d) Not restocking		
a' erosion		
negligible	1,544,347	
b' erosion		
moderate	387,923	
c' erosion		
critical	<u>404,680</u>	
Total not restocking		2,336,950
(e) Game & wild life forest		873,399
(f) Farm forest		<u>3,363,314</u>
Total forest		14,533,292
(2) <u>Park & Recreational Land</u>		94,946
(3) <u>Agriculture</u>		
(a) Crop		7,813,826
(b) Pasture		3,238,419
(c) Other farm (exc. woodland)		<u>893,925</u>
Total agriculture		11,946,170
(4) Estimate for towns, railroads, roads and		
Misc. use		<u>2,118,072</u>
Total land in State		28,692,480

If abandoned farms and other land slowly reverting to forest is excluded, there still remains something over 13,000,000 acres of land under some forest cover. These figures are partly estimates. They include data from all special forest land and abandoned farm land surveys made in the State and available to date, as well as data from the United States Census and the State Departments concerned.

TIMBER REDUCTION

To arrive at the present timber stand and growth in the state it is necessary to reclassify the forest area, excluding the reverting cleared land and rounding to thousands:

Forest Land by Types and Stand Conditions

<u>Forest Class</u>	<u>Beech-Birch-Maple Type</u> (Acres)	<u>Oak-Hickory Type</u> (Acres)	<u>Total Area</u> (Acres)
Saw timber	450,000	1,381,000	1,831,000
Cordwood stands	1,959,000	3,470,000	5,429,000
Growth below cordwood			
(a) Restocking	1,563,000	1,670,000	3,233,000
(b) Unsatisfactory	200,000	1,000,000	1,200,000
Practically deforested	<u>285,000</u>	<u>1,107,000</u>	<u>1,392,000</u>
Totals	4,457,000	8,628,000	13,085,000

The approximately 28,000,000 acres of virgin forest in Pennsylvania may be safely estimated to have averaged 10,000 board feet per acre. Large areas of virgin hemlock and hardwoods averaged 20,000 board feet, and individual stands ran up to 50,000 and even 100,000 board feet per acre. It is evident

that this magnificent virgin forest contained about 280,000,000,000 board feet of timber. There were cut and utilized about 70,000,000,000 board feet of timber (log size) up to 1870 and 100,000,000,000 board feet since 1870. The other 110,000,000,000 board feet must be accounted for in actual destruction of logs in the clearing of early farms; for the bark alone used in tanning, leaving the then unmerchantable peeled hemlock, chestnut oak, and chestnut logs to rot on the ground; for fuel wood; ties; poles; mine timbers; pulpwood, and minor products. Forest fires also took a heavy toll, though these have been worse in their cumulative effect on the second growth forest.

This virgin forest has been stripped from our lands and only a few small remnants of its glorious expanse now remain.

The following table shows the total lumber cut of Pennsylvania for census years from 1870 to 1930. Detailed record of species is available only from 1900. Hemlock, oak, white pine and chestnut have been the leading species. In 1900 the conifers, hemlock, white pine and yellow pine, formed 71 per cent of the cut. In 1930 they formed only 29 per cent of the cut. It is estimated that our lumber cut will fall to about 200,000,000 feet, and that over 90 per cent of this cut will be hardwood, before the improved forest management is able to again start the cut upward.

PENNSYLVANIA'S LUMBER CUT

(U. S. Census)

<u>Species</u>	<u>C e n s u s</u>	<u>Y e a r</u>			
	<u>1870-1880-1890</u> (Million board feet cut)	<u>1900</u>	<u>1910</u>	<u>1920</u>	<u>1930</u>
Hemlock		1,558	687	225	80
Oak	Cut not	342	297	145	92
Chestnut		45	108	85	19
Maple	detailed	49	92	49	40
White pine		221	92	44	11
Beech	by species	-	57	39	34
Yellow pine		18	33	2	-
Birch	prior to 1900	10	22	11	6
Yellow poplar		10	15	7	-
Ash	census	5	10	4	-
Basswood		10	13	6	3
Hickory		4	15	1	2
Allowance for other species and for mills not reporting		61	22	22	27
Total cut	1,630-1,734-2,113	2,333	1,463	640	314

The next table shows Pennsylvania's fall from first place among the lumber producing states of the Union in 1850 to twenty-second place in 1929.

The maximum cut occurred in 1899 (1900 Census report) when 2,333,000,000 board feet were cut, and the lumber towns such as Cross Fork, Cammal, Sinnemahoning, and a dozen others of the north central part of the State had not yet vanished. Had adequate planning and foresight been exercised by the State fifty years ago, these communities would be thriving today and nearby agricultural lands, now also abandoned, would still be the location of prosperous families. There would be millions more of taxable property. Pennsylvania has sufficient land for forest management to bring back her

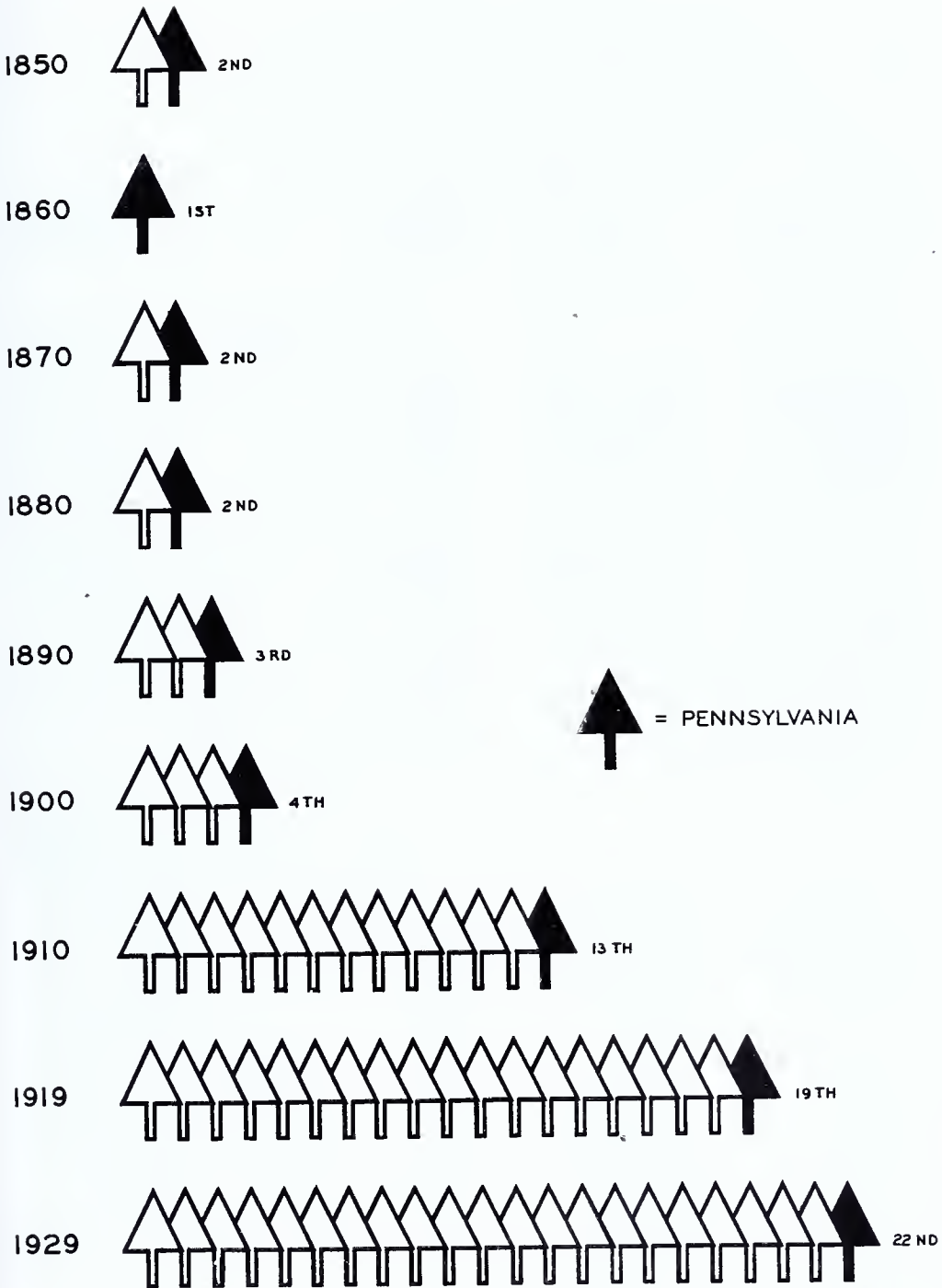
maximum limber cut and associated forest industries - tanning, paper making, wood distillation, stave manufacture and all the others.

PRESENT FOREST INDUSTRY

The accompanying table on Forest Industries gives the Census data on Pennsylvania primary and secondary wood industries, whose raw material is wood or wood fiber to a considerable degree. These industries employed over 62,000 workers or 5.4 per cent of all gainfully employed workers in the State. They received almost \$91,000,000 in salaries and wages, or 5.2 per cent of all paid in the State. The output of these plants had a value of \$348,000,000 or 4.7 per cent of all manufactures in the State. Even at our low ebb of 1929 the wood industries are found large enough to have their future supply of raw material planned for on a large scale. Additional industries will be developed as the lumber and wood products again begin to increase.

WOOD CONSUMPTION

The following table sets forth the approximate wood consumed and that cut within the State. The excess consumed is shipped into the State from other states, Canada, and other foreign countries. Wood and wood pulp have come in from as far as Scandinavia and Russia.



FALL OF PENNSYLVANIA IN RANK OF STATES PRODUCING LUMBER



FIGURE NO. 46

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Forest Industry in Pennsylvania
(Census for 1929, figures rounded)

<u>Industry</u>	<u>Employees</u>	<u>Salaries and Wages</u>	<u>Value of Product</u>
<u>Primary Wood Products</u>			
Lumber and timber	3,605	\$3,716,000	\$10,874,000
Planing mill	7,069	12,405,000	35,367,000
Box mfg.	1,757	2,299,000	7,567,000
Cooperage	563	829,000	5,063,000
Custom			
saw-mills (est.)	2,000	2,000,000	5,000,000
Paper and pulp	10,864	17,453,000	95,509,000
Wood distill.			
and charcoal	721	857,000	3,654,000
Wood preserving	118	171,000	3,493,000
Wood turned, etc.	<u>1,357</u>	<u>1,554,000</u>	<u>4,064,000</u>
Total	28,054	41,284,000	170,591,000
<u>Secondary and Part-wood Products</u>			
Agricultural			
Implements	897	1,327,000	2,996,000
Bags - paper	698	973,000	5,153,000
Boxes - paper	5,985	6,575,000	21,368,000
Cardboard	365	765,000	2,489,000
Carriages, wagons, sleds	245	337,000	1,035,000
Caskets, burial cases	8,834	14,571,000	74,364,000
Envelopes	961	1,236,000	4,093,000
Furniture	13,713	19,841,000	55,512,000
Lasts, etc.	67	117,000	216,000
Models & patterns	635	1,033,000	2,161,000
Refrigerators	514	867,000	2,156,000
Wall paper	<u>1,318</u>	<u>2,041,000</u>	<u>6,794,000</u>
Total	34,232	49,683,000	178,337,000

PENNSYLVANIA ANNUAL WOOD CONSUMPTION AND CUT (PRE-DEPRESSION)

<u>Material</u>	<u>Unit</u>	<u>Quantity of Each Unit</u>		<u>Equivalent</u>	
		<u>Consumed</u>	<u>Cut</u>	<u>Standing Tree</u>	<u>1/Volume</u>
		See unit column		Consumed-Cut in State	
				Million cu. ft.	
Lumber	Mill.ft.B.M.	2/ 1,900	313	414.0	68.6
Fuel wood					
Farms	Thou. cords	859	859		
Other rural	" "	487	487		
Total	" "	1,346	1,346	102.3	102.3
Hewed ties	" pcs.	4/ 1,000	506	4/ 12.0	6.1
Fence posts	" "	5,100	5,100	7.7	7.7
Pulpwood	" cords	353	82	40.0	9.5
Woodpulp	" "				
(imported)	" "	400	-	46.0	-
	(equivalent)				
Mine timber					
(round)	Mill. cu. ft.	100	75.1	130.0	97.7
Logs, veneer,	" " "				
export & mfg.	" " "	11	11	2.8	2.8
					0.7
Cooperage stock,					
slack and tight		3/	small	3/ 24.0	small
Shingles	Thousands	4/	100	4/ 2.0	small
Poles and piling	"	4/	20	4/ 5.0	0.2
Cordwood	" cords	212	212	12.1	12.1
(Distil.,tanning,					
excelsior, etc.)					
Total (utilized)				797.9	307.7
Fire drain-93,000 acres loss yearly				18.6	18.6
10 yrs. growth or 200 cu. ft. per A.					
Insect drain				3.0	3.0
Loss in natural thinning unutilized trees over 3.5 in.					
10% of growth				39.0	39.0
Total forest drain				858.5	368.3

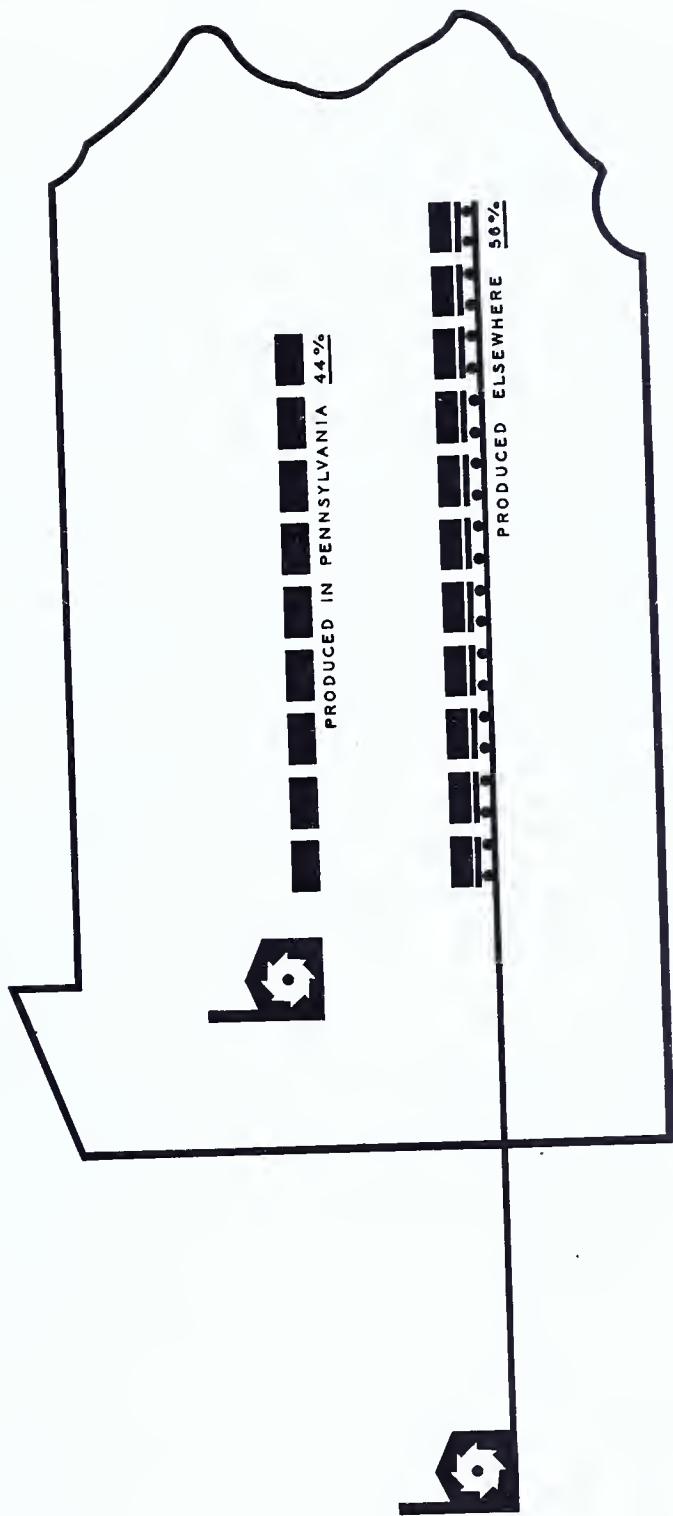
1/ Peeled volume.

2/ Approx. av. pre-depression figure; 596 mill. bd. ft. consumed in 1932.

3/ Penna. cooperage plants manufacture 8 per cent of the value of all cooperage products in the U.S. The consumption of staves and heading was therefore taken as 8 per cent of the U.S. Total.

4/ Estimate.

5/ The "cut" figures are averages for 1925-29. The "consumed" figures are pre-depression but not always five year averages as these are not available in many cases.



LUMBER CONSUMED IN PENNSYLVANIA



FIGURE NO. 47

STANDING TIMBER

Using the same forest land classification as is included under "area", the volume of growing trees may be estimated as follows:

Standing Timber in Pennsylvania

Land Class	Beech-Birch-Maple		Oak-Hickory	Total
	Type		Type	Stand
	(Million Bd. Ft.)			
Saw Timber	Softwood	367	779	1,146
	Hardwood	<u>1,317</u>	<u>3,434</u>	<u>4,751</u>
	Total	<u>1,684</u>	<u>4,213</u>	<u>5,897</u>
(Thousand cords)				
Cordwood	Softwood	880	4,254	31,716
	Hardwood	<u>30,836</u>	<u>30,179</u>	<u>34,433</u>
	Total	<u>31,716</u>	<u>34,433</u>	<u>66,149</u>
(Below cordwood size generally)				
Restocking	-		-	-
Satisfactory	-		-	-
Unsatisfactory	-		-	-
Deforested	-		-	-

The growth of peeled wood is estimated below for the forest land classes adopted. A recent growing stock survey of 60,000 acres in 70 scattered compartments of State Forests gave an average growth of 37 cu. ft. of unpeeled wood or about 33 cu. ft. of peeled wood per acre and year in trees 3.5 inches in diameter breast high and over. The average growth of 29 cu. ft. per acre for this State-wide estimate appears good if trees above 3.5 inches in diameter lost in natural thinnings are included. Some allowance must then be made under "forest drain" for this loss.

ANNUAL WOOD GROWTH IN PENNSYLVANIA

Land Class	Beech-Birch-Maple				Oak-Hickory				Total	
	Type		Growth		Type		Growth		Total	
	Growth per acre	Total	Bd.Ft.	Mill. Cu.Ft.	Growth per acre	Total	Bd.Ft.	Mill. Cu.Ft.	Saw Timber	Cu.Vol.
	Bd.Ft.	Mill. Bd.Ft.	Bd.Ft.	Mill. Cu.Ft.	Bd.Ft.	Mill. Bd.Ft.	Bd.Ft.	Mill. Cu.Ft.	Mill. Bd.Ft.	Mill. Cu.Ft.
Saw Timber	80	20	35	9	80	36	110	49	145	58
Cordwood	-	30	-	59	-	40	-	139	-	198
Restocking:										
satisfactory	-	35	-	55	-	30	-	50	-	105
unsatisfactory	-	17	-	3	-	15	-	15	-	18
Deforested	-	0.5	-	-	-	-	-	-	-	-
Grand Total	-	-	35	126	-	-	110	253	145	379

Note: The average acre stand for the 13,085,000 acres of forest land is placed at 643 cu. ft. of peeled wood - the average increment 29 cu. ft. per acre or 4.5 per cent. This increment per cent falls as the average stand increases in quantity and size.

Here is the vital argument for growing more timber in the State, by extending State forest ownership; by better forest protection and management; and by reforesting all abandoned farms and idle lands available. We are growing but 379,000,000 cubic feet of wood each year, and we are consuming almost 858,000,000 cubic feet. In other words, the State is importing 56 per cent of its wood requirements. Our supplies are being brought from farther and farther points, until now much comes from the Pacific Northwest.

Importation of lumber, wood and paper pulp from Canada, Russia or Finland is frequently held as a solution for our excess wood needs. Imports from these countries must be a temporary expedient only. Densely populated Europe will in the long run absorb any exportable surplus from her northern nations. The Canadian supply of timber is now definitely known to be much less than was formerly thought, and relief does not lie there.

It costs \$18 to \$30 per thousand feet to transport lumber from the Pacific Northwest via the Panama Canal to points inland from the east coast by combined ship and rail haul. Freight rates on lumber from the south to Pennsylvania run from 35 cents to 45 cents per hundred pounds, or from \$10 to \$21 per thousand feet. In many instances timber can be grown in the State for the excess freight costs.

After the war forest products formed about 10 per cent of the railroad freight traffic of the country. It exceeded any

simple commodity except bituminous coal in freight volume. It averaged in 1922 \$4.03 per ton for the average haul of 175 miles.*

Forests produce 1500 to 3000 pounds of wood per acre and year for transportation. This is a larger production of freight volume per acre than the average from farm land.

EFFECT ON AGRICULTURE

In many counties of the State agriculture went forward with the nearby forest industries furnishing the required market. It is no coincidence that the peak of the State's lumber production was also the peak of the total and improved farm land area. An accompanying chart shows the decline in agriculture with the decline in the lumber industry.

In some counties like Lycoming the decline in the forest industries - lumber and tanning - was obscured by added developments in other industries. The results of the up-surge of the forest industries and agriculture in the north central part of the State about 1900 only to be followed by the exhaustion of the forest and the abandonment of near-by farms since 1910, may be noted in the data on population and non-forest farm areas in this section. The population of Cameron, Elk, Forest, Potter and Sullivan Counties reached a peak, in the lumber boom in 1900, of 93,745. By 1930 the population of the same counties had shrunk to 68,906, a loss of 26 per cent. Individual counties like Sullivan, Potter and Forest had higher percentage losses.

* "The American Lumber Industry," Nelson C. Brown, 1923.

Loss in Population and Cleared Farm Land
in Certain Forested Counties

	<u>Population</u>			<u>Cleared Farm Land</u>	
	<u>1900</u> (Number)	<u>1930</u> (Number)	<u>Decrease</u> (Per cent)	<u>Decrease 1910-1930</u> (Acres)	<u>Decrease 1910-1930</u> (Per cent)
Potter	30,621	17,489	43	55,498	28
Cameron	7,048*	5,307	25	13,347	61
Elk	32,903*	33,431	(From 1910) 7	9,981	19
Forest	11,039	5,180	53	5,163	21
Sullivan	12,134	7,499	38	9,258	14
Total	93,745	68,906	26	93,247	26

* Peak in 1910 was 35,871 in Elk County and 7,644 in Cameron.

Elk County had a large tanning industry which has suffered from the wiping out of the hemlock forest. But the timber from Elk County was milled at mills in adjacent counties. Hence its loss in population (from 1910) is not as great as that in the surrounding counties. The retaining of non-forest industries has helped this county.

For the group the loss of 26 per cent of the population, compared to a gain of 8.6 per cent in the State rural population as a whole is significant. The loss of* 26 per cent of the non-wooded farm area in these counties compared to 16 per cent for the State as a whole also possesses significance greater than the actual difference in figures. The conclusion that the forest portions of the state can be benefited greatly both agriculturally and industrially by the restoration of the forest and its

*More specific analyses showing the decreased economic welfare of the forest region were not possible in the time available. Such measures as assessed property values, farm incomes, etc. are complicated for comparison by changing dollar values, changing bases for assessment, lack of uniformity in census methods, etc.

supply of raw materials seems fully warranted.

TAX DELINQUENCY

In addition to a detailed forest tax study in 1932 in Elk, Sullivan, Potter, Centre and Clinton (forest) Counties, and Adams, Franklin and Crawford (agricultural) Counties, the Department of Forests and Waters obtained reports of land tax delinquency early in 1933 in 43 additional counties. The eight counties studied in detail possess 2,518,000 acres of forest land, or almost 20 per cent of the total forest land of the State. The other 43 counties brought the tax delinquency survey up to over 80 per cent of the forest land. Estimates were made for the missing 16 counties.

County records are very incomplete in separating clear and forest land. They also lack uniformity in dates to which the lands were sold or advertised for sale for delinquent taxes. The last delinquent taxes involved were for 1931, but for some counties no action was taken that recently. The canvass does not reflect the full seriousness of land tax delinquency. Lands are constantly being redeemed by the owners (a legal privilege for 2 years after sale), new sales are being advertised, and County Commissioners are selling land to which the county has taken tax title, whenever it can be passed back to private owners. So the situation is a rapidly changing* one. The following data show the serious situation in private forest land ownership.

*A. C. W. A. project directed by Pennsylvania State College and the U. S. Department of Agriculture made another canvass of delinquent lands late in 1933 and early 1934. Results of this canvass are not yet available.

Land Tax Delinquency - 1933

<u>Land Class</u>	<u>Sold to Counties</u>		<u>Advertised for Sale</u>	
	<u>Area</u> (Acres)	<u>Assessed Value</u> (Dollars)	<u>Area</u> (Acres)	<u>Assessed Value</u> (Dollars)
Forest land	412,101	1,953,144	326,476	1,296,533
Cleared "	139,996	2,033,028	264,161	7,643,709
Total	552,097	3,986,172	590,637	8,940,242

When the books are cleared for unpaid taxes for 1932, 1933 and 1934, and the records of the slower counties for earlier years are brought up to date, this delinquency will have much larger totals.

Forests cannot produce a crop of timber each year unless the property consists of a considerable acreage and until there has been secured a complete tree assortment of sizes from seedlings to mature timber. This requires forestry practice with long time planning, and a long period to build up our cut-over and burned forest lands. Detailed studies show that repeated annual taxes of from 15 cents to \$7.00 per acre will confiscate the final value of the periodic timber crop 30 to 80 years from the seedling stage. There is no longer a large unearned increment in the value of timber lands, such as in the past furnished the funds to pay high annual taxes on virgin timber bought for a song, and held in a rapidly rising market for 20 to 40 years and then slashed off.

Forest assessments should not average over \$3.50 to \$4.00 per acre during the long growing period when well set with trees,

and when all property is assessed at market value. When other property is assessed at 40 to 60 per cent of full value, or when the land is not well set with desirable trees the assessed value should be reduced to an amount as low as 50 cents per acre.

The Auxiliary Forest acts, declared unconstitutional by the Bucks County Court in 1934, should have a constitutional amendment and should be repassed, in case the higher courts sustain this decision. These acts permitted assessment up to \$1 per acre for the annual tax, and required 10 per cent of the final timber crop value as a "yield tax." These acts afforded relief for forest land from local excessive property taxes.

PARKS AND RECREATION AREAS

Pennsylvania has natural facilities for parks and recreation equalled by few states. It has beautiful forest-clad mountains, studded with springs and glens. It has sparkling rivers, gorges and water vistas that make a perfect complement to the forests. The variety of its plants and trees provides one continual parade for the nature lover, spring, summer, autumn and even into the winter. The rapidly restoring wild life - the hundred and more species of song birds and game birds; the squirrels, raccoons, deer, and bear, and the host of other animals, even the fish-stocked streams add life and movement and zest to the outdoors to a degree not met with in most states.

Pennsylvania's recreational paradise now is open to our large population by a magnificent road system. There are no

fees beyond the nominal resident hunters' and fishing licenses for our citizens. The poorest can enjoy our recreation with the richest, except for transportation. But these recreation facilities need great expansion within the radius of a day's outing (perhaps 50 miles) of our urban population centers. Shorter working hours and more vacation increase the recreational use of our forests and streams. The popular response to added picnic, park and outing facilities is outstripping the present facilities.

On the State Forests the recreational demand is being met by setting aside special use areas for:

- (a) State Forest Parks and picnic places
- (b) State Forest Monuments
- (c) Public camps
- (d) Permanent camp sites

and the creation of semi-independent

- (e) State parks not directly a part of the state forest system.

- (a) The State Forest Parks and picnic places on the state forests now include such places as the Caledonia and Mont Alto Parks in Franklin County, Childs Park in Pike County; Voneida Park ("Hairy Johns") in Centre County; Leonard Harrison Park in Tioga County; Colerain and Greenwood in Huntingdon County; Sizerville in Cameron and the Hemlocks in Perry County. These places have facilities for cooking and picnicking and personal comfort. Trails lead out from these parks and tempt to healthful hiking. Four have swimming facilities.

Four park areas are being added: Parker Dam, Clearfield County; Half-Way, in Union; Riansares, in Clinton and Black Moshannon, in Centre County.

- (b) The State Forest Monuments include historical, botanical, or scenic places and are equally picnic and recreational places. The Buchanan Birthplace in Franklin, the Ole Bull in Potter, Snyder-Middlesworth in Snyder, Bear Meadows in Centre, Detwiler Run and Alan Seeger in Huntingdon, Joyce Kilmer and McConnell Narrows in Union, Mount Logan and Mount Riansares in Clinton and Martins Hill in Bedford Counties.
- (c) The State Forest Public Camps have special camping facilities added to the picnicking facilities. These include shelters, fireplaces, water, tables, benches and comfort facilities. Fifty-one Public Camp sites in the State forests have now been set aside and are still being added to. These may be illustrated by Pine Grove Furnace Camp in Cumberland, Old Forge in Franklin, Laurel Run in Mifflin, Cherry Springs in Potter, Laurel Summit in Westmoreland, and Promised Land in Pike County. These camps are most popular for week end and holiday outings.
- (d) Permanent camp sites are leased on suitable areas in the State forests for summer cottages, hunting lodges, etc. The lease is for a period of ten years with an extension privilege. Building plans must be approved so as to prevent a spoiling of the landscape with unsightly buildings. These camp sites meet the recreational desires of an ever growing class of citizens, as the list of leases shows. Even the depression has not decreased the number of sites leased as is shown by the following figures:

<u>Year</u>	<u>Camp Sites Leased</u>	<u>Receipts</u>
1913	38	\$ 138
1915	252	1,361
1920	573	3,712
1925	1,277	12,611
1930	2,319	22,171
1933	2,850	27,955
Total receipts to date		\$226,517

Up to 1930 the number of personal camp site leases doubled each five years. The taxable value of these camp buildings in three of the 20 State forest districts with state land, already exceeds the cost of the forest to the State and so replaces the forest land withdrawn from taxation. For all the State forest land the taxable value of these camps and summer homes (almost \$3,000,000) is almost 75 per cent of the total cost of the land to the State (slightly over \$4,000,000). With the five cents per acre paid by the State annually in lieu of taxes to the local governments, this camp taxable value goes far to make up for the loss of local tax income from State owned forest lands.

(e) State Parks include historical spots such as:

Fort Necessity	Fayette County	350 Acres
Valley Forge	Chester and Montgomery	1600 "
Bushy Run Battlefield	Westmoreland	169 "
Washington Crossing	Bucks	440 "
Presque Isle	Erie	4370 "
Fort Washington	Montgomery	360. "

also a 40-mile section of the old Delaware Canal in Bucks County known as the Roosevelt State Park 315 "

the Cook Forest Park with a small body of magnificent virgin white pine and hemlock in one part 6500 "

the Ralph Stover Park in Bucks County now being developed along the Tohickon Creek 37 "

A measure of the service of State Forest and Park recreational areas may be seen in the record of visitors to these areas made each year by the Department of Forests and Waters.

<u>Year</u>	<u>Visitors</u>
1923	524,405
1925	841,057
1930	1,289,347
1933	3,484,437

In 1931 additional parks like Roosevelt, Bushy Run, and Fort Necessity were added accounting in part for the increase in visitors.

A table in this section shows that the total land area in park and recreational use in the State is placed at 94,946 acres owned as follows:

	Municipal parks	15,078 Acres
<u>1/</u>	County "	4,010 "
<u>2/</u>	State "	22,258 "
<u>3/</u>	Federal "	1,200 "
	Total Public	42,546 "
	Private recreation	52,400 "
	State total	94,946 "

GAME CONSERVATION

Pennsylvania is famous today for its wildlife. Its wilderness areas furnish a home for thousands of white-tailed deer and for black bears; its mountains harbor flocks of wild turkeys; its woodlands and countryside grouse, bob-whites, and ringnecked pheasants. In the brush, fields and fence-rows rabbits live, and squirrels frisk in the woodlands. On the lakes and streams are migratory waterfowl. This assemblage of game-life places Pennsylvania in the forefront among hunting states of the Union.

-
- Foxes, both red and gray, raccoons, wild cats, skunks,
- 1/ Allegheny County.
 - 2/ Part in State forests.
 - 3/ Gettysburg National Park, part of which is classified as "farms."

minks and weasels are so abundant as to keep a large number of trappers busy during the winter season. A host of valuable small song birds live throughout the Commonwealth, many of them even in the towns. In the mountains are found black ravens, and bald and golden eagles.

Forty years ago no such assemblage of wild life existed in Pennsylvania. In 1900 there were but few white-tailed deer, and black bears were very rare. Far-sighted sportsmen and naturalists foresaw that our wild life would have to be protected carefully, that laws would have to be enacted and enforced, that a body of men who should care for the wild animals would have to be organized, and that an efficient and business-like system of game management would have to evolve.

WILD LIFE PLANNING

Thus in June, 1895, there was created by act of law, a Board of Game Commissioners in Pennsylvania. The Board had one great advantage; they were dealing with a region wonderfully varied and almost ideally located geographically for the protection and development of game-life. While lumbering interests and forest fires had swept most of the mountains, some forests remained, and the wild areas were potential game propagating plants. The climate was favorable; food bearing plants abundant, and the average citizen of Pennsylvania soon caught the spirit of conservation and tried to cooperate.

At first the Board had little money with which to work. A total of \$800 was available in 1896, which was used entirely

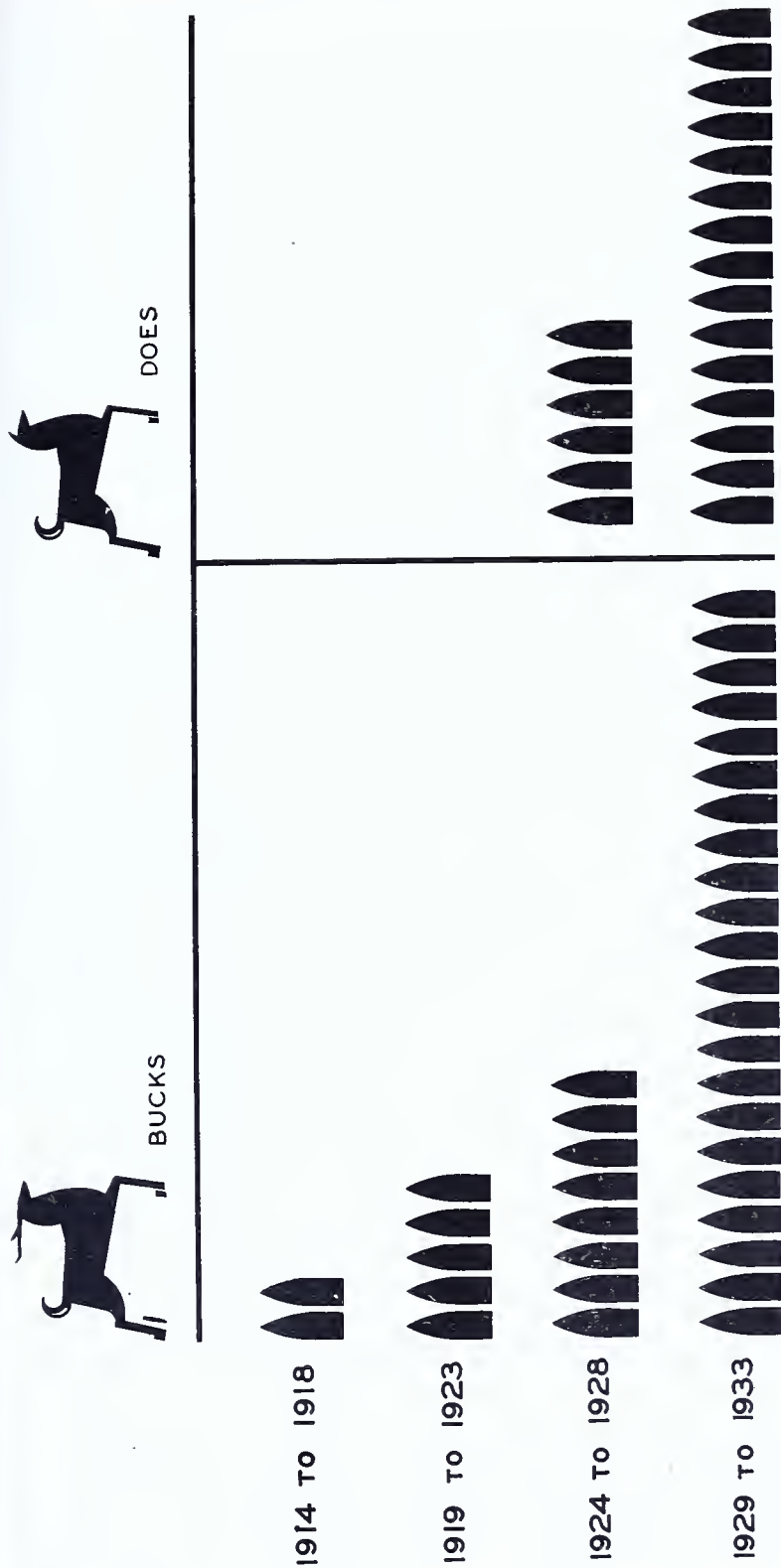
for postage and express. This sum was available each year until 1901, when \$3000 was appropriated. The sum increased rapidly, doubling itself each biennium, until in 1913 \$97,400 was in use. Financial difficulties were so great at first that but one Game Protector could be hired to patrol the whole Commonwealth.

HUNTING RESTRICTIONS

The Board was especially interested in saving Pennsylvania's deer, which at that time were practically extinct. In June, 1897, they obtained passage of a law which stopped the use of hounds in hunting deer. Market hunting had not yet been stopped, but the unfairness of hunting the rapidly dwindling deer herd with hounds, as well as with modern firearms, had a popular appeal and the law was put into effect at once as efficiently as possible under the circumstances. The act of 1897 was the first concentrated attempt to put a stop to market hunting, which was recognized by the Board to be the most objectionable single feature of the game conservation problem as it stood at the close of the Nineteenth Century. The act of 1897 led to a subsequent law which prohibited the sale of game and which eventually put a stop to all market hunting.

In 1903 a law was passed which established the non-resident hunter's license fee at \$10. The sale of such licenses was not great.

In 1905 was passed the first Game Refuge law which set into motion a system which has since become world famous, and which has been widely followed. The first Game Refuge was established in Clinton County on State Forest Land, since that was the only



DEER KILLED IN PENNSYLVANIA

EACH BULLET = 5000 DEER KILLED



FLANNERY
BOARD

FIGURE NO. 48

land available. On this refuge the game was safe, and about the tract of land set aside as absolute sanctuary was an area of public hunting ground where all sportsmen of the Commonwealth could spend their recreation hours, on State-owned property available for their use for all time. While the refuge system has grown and been modified considerably, the original principles have been retained, and the fact that hunters have a wholesome respect for the refuges because they recognize them as the best sources of their game supply, has made the system tremendously popular.

In 1905 black bears were given protection. While some men at that time regarded bears as destroyers of property, others felt they were a valuable game animal. The sportsmen won, and Pennsylvania was the first state of the Union to recognize the black bear as an almost altogether harmless animal, desirable as game. By degrees the bear law tightened so that eventually steel traps, dead-falls, and such means of capture were not permitted. Finally, hunters were permitted to take but one bear apiece, and small cubs were given complete protection.

In 1907 two important laws were passed - one protecting all female deer, permitting only bucks with antlers visible above the head to be shot; but placing no restriction on the size of the antlers. Such restriction followed in later years until today only bucks with two or more points to an antler are legal. The other one prohibits the use of automatic guns in killing game. The so-called "buck law" of 1907 is largely

responsible for the tremendous deer population present in Pennsylvania today.

In 1908 a law was passed preventing unnaturalized foreigners from possessing shotguns and rifles. In 1915 a law was passed preventing foreigners from owning dogs and pistols.

FINANCING OF GAME PROGRAM

Probably the most important step in the development of our Game Protection System was the hunters' license law of 1913. With the adoption of this law, which provided for a license fee of \$1, funds immediately became available. A corps of Game Protectors could now be hired and properly paid; lands could be acquired for game refuges; game animals could be brought in from outside the Commonwealth to replenish the decreasing supply; law enforcement could begin in earnest. The wild life conservation movement was gaining impetus rapidly.

In 1913 was brought into being the first effective 'bounty law.' which permitted the paying of a certain sum of money for each animal destructive to game, killed by citizens who reported their work by sending the dead animal or its skin in for examination and for payment of reward. According to this law \$4 was to be paid for each wildcat, \$2 for each gray fox, \$2 for each weasel, and 50 cents for each goshawk, sharp-shinned hawk, and great-horned owl. In 1915, and during subsequent years, this bounty law was modified to its present form. Bounty was paid on

hawks and owls only during 1913 and 1914. From 1915 to 1921 a bounty of \$1 was paid on minks.

By 1914, most of the features of the game conservation movement which are recognized as so important in Pennsylvania today were in effect. Market hunting had long since been stopped, and with the stopping of this practice "game hogs" were gradually weeded out. But market hunting was stopped too late to save the Passenger Pigeon -- a bird which might today be a splendid form of game life, so abundant and so easily approached that the youngest hunter might go to the woods reasonably certain of returning with a bag of game.

By 1914 deer were noticeably on the increase, bears were prospering, small game was holding its own, game refuges surrounded by public hunting grounds were being established, natural enemies of game were being controlled, and over the Commonwealth was developing such a genuine interest in and sympathy for wild life that the average Pennsylvania citizen was by degrees, and in a sense, himself becoming a Game Protector.

In 1917 the Auxiliary Game Refuge law was passed. This gave the Board authority to lease the hunting rights, for a period of ten or more years, on lands suitable for game refuges and public hunting grounds. Refuges could thus be established in sections where land was not available or was too high priced for purchase.

In 1919 the Legislature passed a law authorizing the Board

of Game Commissioners to purchase lands to be known as State Game Lands and to be used for game refuges and public hunting ground purposes. This made it possible to purchase lands in sections of the Commonwealth where no State-owned land was available. The first purchase was made in Elk County in 1920. Thus was started a program whereby the sportsmen purchased their own land. It is of the greatest importance that the larger State Forest lands are also in effect public shooting grounds, with many game refuges on them.

In 1923 all the Game Laws were codified and thereby made more intelligible. In 1923 the Resident Hunter's License fee was increased to \$1.25, the Non-Resident Hunter's License fee to \$15.

BOARD OF GAME COMMISSIONERS

Today, there are eight, instead of six, Board members. Not one of these men receives a salary. The Board is still free of political entanglements. It is the duty of the Board to determine Pennsylvania's policy of wild life conservation. The Legislature fixes the hunting seasons and acts upon certain features of wild life control, but the Board has the power of changing the seasons and daily and seasonal bag limits of game as local conditions seem to warrant. This power of changing seasons, of regulating bag limits, and of closing certain sections or all of the Commonwealth to the shooting of certain species, is one of the most important powers of the Board and is one of the fundamental reasons for the success of game

management in Pennsylvania today. The Board has control of the funds which accumulate from the sale of hunters' licenses, from fines and other sources of revenue. The Game Fund is maintained separately from other monies so that direct returns are made to the sportsmen who have paid their license fees. The revocation of hunters' licenses and of special licenses is in the hands of the Board.

All of the Board members are official Game Protectors and may arrest on sight, without warrant, any violator of the Game, Fish or Forestry Laws.

The Board elects an Executive Secretary who carries out their plans and policies. He is the Chief Game Protector of Pennsylvania and with the approval of the Governor has charge of the hiring of men throughout the field and office force, has direct supervision of the various branches of the work with offices in Harrisburg, and carries out as nearly as possible the program of game management as conceived by the Board.

REFUGES AND SHOOTING GROUNDS

The Bureau of Refuges and Lands is charged with the acquisition of all lands for game refuges and public hunting grounds for the Board of Game Commissioners; the creation of game refuges; the supervision over refuge keepers and the maintenance of State Game Lands and Game Refuges.

The Pennsylvania Game Refuge system at present consists of 111 Primary Game Refuges, most of which are under the supervision

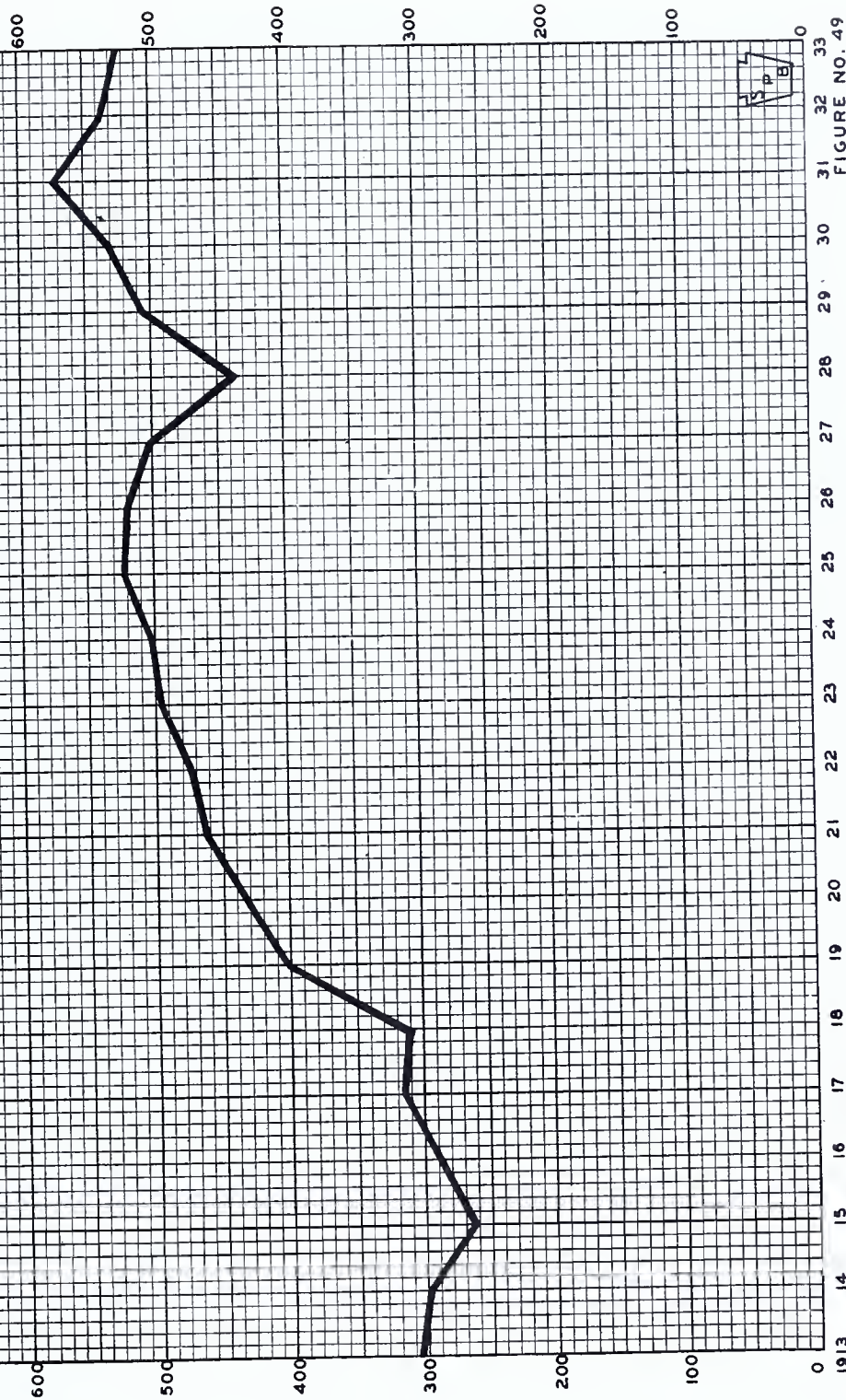
of salaried game refuge keepers, some of the keepers having supervision of several refuges, and 66 Auxiliary Refuges which are looked after by Game Protectors and other salaried field officers. Primary Refuges total 100,127 acres and Auxiliary Refuges, 23,231 acres. The system of control is the same with each class. All are surrounded by a single strand of No. 9 wire, a brushed line eight to ten feet wide and conspicuously posted. All refuges are surrounded by public hunting grounds. Refuges for large game are 1,500 to 3,000 acres in size, for small game such as wild turkeys, grouse, quail, etc. are smaller. ranging in size from 100 acres to 1,000 acres. To date the sportsmen of Pennsylvania have acquired by purchase over 452,950 acres of State Game Lands.

The land purchase program was further extended in 1927 when the Resident Hunting License fee was increased to \$2, seventy-five cents of which was ear-marked for purchase of land, the creation of game refuges and the maintenance of the game refuges and public hunting grounds. The land purchase program is proceeding with the purchase of approximately 75,000 acres per year. This will continue for several years unless there is a change in the present law, and should enable the Commission to completely finance a long time plan for perpetual game and wild life conservation in the State.

This Bureau also arranges for cooperative construction of deer-proof fences to relieve landowners from depredations by deer.

RECORD OF RESIDENT HUNTERS' LICENSES ISSUED

THOUSANDS OF LICENSES



PENNSYLVANIA BOARD OF GAME COMMISSIONERS

FIGURE NO. 49



Refuge keepers, with whatever assistance is needed, keep old roads, trails and refuge lines well brushed out at all times. The refuge wire is kept in good condition. Lines around the refuge are brushed out to a width of about ten feet, and are posted with notices bearing the words: "State Game Refuge; Hunting is Unlawful" about every seventy-five yards, in addition to notices containing rules and regulations governing the refuge, which are placed between these signs.

They wage constant warfare on natural game destroyers. A large part of their time during the winter months is taken up with the trapping and killing of predatory animals.

They make repairs on roads leading to the refuge, where the road is under the control of the Game Commission. Each refuge is provided with a telephone and it is usually necessary to construct a few miles of telephone line to the refuge house.

Each refuge keeper, wherever it is possible to do so, plants a number of game-food and game-cover trees or shrubs, and in certain cases cultivates plots with grain for game food.

The grounds around each refuge keeper's house are kept as attractive as possible at all times. This is accomplished by planting ornamental trees or shrubs.

GAME PROTECTION

The Bureau of Protection has charge of field work in enforcing the game laws and its force comprises seven supervisors, 65 county protectors, 12 assistant county protectors and 10

traveling protectors. Appointments to this service as well as for refuge keepers are made by competitive examination, which is duly advertised, and the applicants are subjected to a very thorough examination on ten different subjects, and the appointment is made by a selection from the three highest papers, physical qualifications, of course, being taken into consideration. As a result of this examination we are getting an unusually high type of officer in the service. All salaried field officers are now fully uniformed and a permanent training school for these officers has been established. Here game laws are studied carefully. The officers are given a special course in public speaking to better enable them to present the work of the Game Commission at sportsmen's and other gatherings. They are taught the art of self-defense and how expertly to use and handle firearms. Pennsylvania also has a force of over 600 Deputy Game Protectors who serve without remuneration because of their keen interest in the work.

One of the important phases of the work of the Game Commission is the control of animals which destroy game. The Game Protectors and refuge keepers destroy all the predatory creatures that they can, but it has been found worthwhile to offer stated sums of money for the killing of certain species of animals when these animals or their pelts are properly forwarded to Harrisburg together with a legal claim for bounty. The policy is not to exterminate any kind, but merely keep them under control to save game species. A bureau for this purpose

was established in April, 1915. This bureau, known as the Bureau of Predatory Animals, is concerned principally with the examination and payment of all such legal bounty claims.

Today bounty is paid as follows: \$15 for each wildcat; \$4 for each gray fox; \$1 for each weasel, and \$5 for each goshawk killed between November 1 and May 1. Over \$100,000 is spent annually for this purpose. The payment of bounties in Pennsylvania is more or less traditional for it goes back as early as 1683, when 10 shillings was paid on dog wolves.

The Bureau of Education conducts biological researches, delivers lectures to organizations on request, makes motion pictures of wild animal life of the Commonwealth, and prepares and issues a monthly magazine known as the Pennsylvania Game News, as well as bulletins and posters of interest to sportsmen and scientists. There is an increasing demand for accurate information as to the wild life of the Commonwealth from sportsmen's associations, service clubs, nature study societies and Boy and Girl Scout organizations, which the Commission has been greatly pleased to recognize, and some 300 lectures were delivered during the past year.

PROPAGATION AND STOCKING

Game propagation, which was started on several Game Refuges in 1928 on a small scale and with almost no facilities, has progressed so that now the Commission owns four regular State Game Farms, two for rearing ringnecked pheasants and rabbits, one for quail, and one for wild turkeys.

This year these farms set a production record never before equaled by any state or privately owned game farm system. From January 1, 1934, to September 20, 1934, the four State Game Farms shipped the following birds for restocking purposes: 43,995 ringnecked pheasants, 5,325 bob-white quail, 2,000 wild turkeys and 833 wild ducks. Further shipments which will be made before the end of this year will increase the production for restocking purposes to approximately the following: 45,000 ringnecked pheasants, 7,000 bob-white quail, 2,500 wild turkeys, and 1,000 wild ducks. Much game is also purchased annually. Last season over 50,000 cottontail rabbits were purchased and released, also a goodly number of fox squirrels and raccoons.

Under the present policy of restocking depleted areas of the Commonwealth with wild life, game is never released on lands which are posted against hunting, nor on areas which are open only to a privileged few. It is released only on areas that are closed to hunting entirely, such as game refuges, or on lands which are wholly open to public hunting.

EXPENDITURES AND REVENUE

The budgeting and accounting in connection with the Game Fund is handled by the Bureau of Office Maintenance. The income, which makes up the Game Fund comprises that received from the sale of hunting licenses, from the sale of special licenses such as taxidermy, fur dealers, ferret owners and numerous others, and penalties. This amounted during the fiscal year June 1, 1933, to

May 31, 1934, to \$1,134,664.81.

Hunting is a source of great revenue. The value of the game killed, computed on the average prices paid for like species in the open market, is well over \$10,000,000; that of fur-bearing animals is nearly \$2,000,000. Also, it is conservatively estimated that each hunter spends approximately \$10 per capita a year. This includes his \$2 license, arms and ammunition, clothing and other equipment, foodstuffs, transportation and other items of expense. During the year 1933 there were 524,337 licensed resident hunters in Pennsylvania. On the basis of \$10 each this amounts to \$5,243,370 spent by the hunters of Pennsylvania that year. In addition over 100,000 hunt without license on their own land and non-residents would increase this amount considerably. Computed also on a conservative basis we find that, with the value of game killed and furbearers taken, hunters receive on an average almost \$18 for every \$1 spent.

One other important valuation accruing as a result of hunting but which is seldom credited to this great sport is the value of song and insectivorous birds to the farmer. Every dollar spent to protect and increase these valuable allies of man is contributed by the sportsmen.

LAND USE PLAN

The principal uses for non-agricultural lands are:

- (1) Forests
- (2) Game

(3) Recreation

The forest is the basis for all of them and the three uses are so inextricably associated that there is need for the closest cooperation to assure the maximum service of these lands to all our people. Lands producing timber can simultaneously produce game, and the beauty spots can be set aside and developed for recreation. Likewise game lands with rational planning can produce wood products to a great degree without sacrificing cover or food for wild life.

The growing social aspects of forests and the failure of private ownership as reflected in the obliteration and devastation of the virgin forests, the subsequent burning of the cut-over lands, and now the extensive abandonment of large areas for taxes - all point to a need of greatly extended government interest in and ownership of our forest lands.

The outstanding recommendations for forest lands are the increase of land in State Forests by 3,081,340 acres; the establishment of county owned forests (largely from delinquent tax lands) of 171,962 acres; the increase of State game lands of 601,331 acres; the increase of land in the Allegheny National Forest by 199,277 acres, or a total increase of 4,056,755 acres of forest in public ownership. This is made up partly of forest land now privately owned, and partly of non-forest land now privately owned to be bought and reforested by the State, county and Federal governments.

RECOMMENDED FUTURE LAND OWNERSHIP AND CHANGES

	<u>Present Area</u>	<u>Recommended Increase</u>	<u>Future Decrease</u>	<u>Permanent Future Area</u>
(1) <u>Forest Land</u>				
(a) Municipal	15,169	2,663		17,832
(b) County	0	171,962	--	171,962
(c) State				
a' Forest	1,647,381	3,081,340	--	4,729,221
b' Game	440,286	601,331	--	1,041,617
(d) Federal	401,023	199,277	--	600,300
Total public	2,504,359	4,056,573		6,560,932
(e) Private farm forest	3,363,314	--	--	3,363,314
(f) Private non-farm, inc. game land & abandoned farms	8,665,619	--	2,443,854	6,221,765
Total private	12,028,933	--	2,443,854	9,585,079
Total all forest	14,533,292	1,612,719	--	16,146,011
(2) <u>Recreation and Park Land</u>				
(a) Municipal	15,078	6,367	--	21,445
(b) County	4,010	2,800	--	6,810
(c) State	22,258	135,072	--	157,330
(d) Federal	1,200	--	--	1,200
Total Public	42,546	144,239	--	186,785
(e) Private recreation	52,400	7,377	--	60,277
Total all recreation	94,946	152,116	--	247,062
(3) <u>Agriculture</u>				
(a) Crop land				
a' Private)	7,813,826	--	429,585	(7,359,957
b' Public)				(24,284
(b) Pasture (exc. woodland pastured)				
a' Private	3,238,419	--	441,325	2,785,687
b' Public				11,407
(c) All other land in farms	833,925	--	893,925	--
Total Agriculture (ex. woodland)	11,946,170	--	1,764,835	10,181,335
Urban, R.R. roads etc. (except farm wood)	2,118,072	--	--	2,118,072
State land area	28,692,480	--	--	28,692,480

RECOMMENDED FUTURE FOREST OWNERSHIP IN PENNSYLVANIA

	(All figures in acres)					Total Public	Private Forest Lands	Total all Forest
	RECOMMENDED GOVERNMENT OWNED FOREST LAND							
	Municipal	County	State		National			
			Forest	Game				
Adams	0	0	30,370	10,000	300	40,870	61,911	102,681
Allegheny	681	0	0	15,399	0	18,080	91,494	107,574
Armstrong	0	41	50,000	20,000	0	70,041	126,986	197,027
Beaver	0	5,058	10,000	20,500	0	35,558	82,519	118,077
Bedford	0	80	120,000	31,400	0	151,480	237,221	388,701
Berks	235	8,000	53,774	20,000	0	82,009	81,575	163,584
Blair	5,000	3,000	75,000	15,000	0	98,000	108,640	206,840
Bradford	0	5,000	50,000	40,000	0	95,000	259,111	354,111
Bucks	0	1,482	0	19,700	0	21,182	98,936	120,118
Butler	2,000	4,500	35,000	30,000	0	71,500	147,849	219,349
Cambria	0	120	60,000	14,127	0	74,247	200,738	274,985
Cameron	0	0	140,000	16,000	0	156,000	68,444	224,444
Carbon	0	5,000	81,000	13,500	0	99,500	92,298	191,798
Centre	100	0	262,500	22,500	0	285,100	247,161	532,281
Chester	0	152	151	12,000	0	12,303	96,355	108,658
Clarion	0	5,000	40,000	13,300	0	58,300	141,182	199,482
Clearfield	0	5,000	200,000	24,000	0	229,000	355,909	584,909
Clinton	0	4,000	302,000	17,400	0	323,400	133,302	456,702
Columbia	61	10,000	31,000	12,000	0	53,061	87,427	140,488
Crawford	0	9,000	10,000	10,000	0	29,000	189,205	218,205
Cumberland	0	75	40,000	10,000	0	50,075	41,755	91,830
Dauphin	0	5,000	30,000	10,000	0	45,000	86,575	131,575
Delaware	0	4,000	0	5,000	0	9,000	17,563	28,563
Elk	0	38	155,000	53,000	123,000	331,038	130,448	481,484
Erie	0	10,070	0	10,000	0	20,070	104,723	124,798
Fayette	0	44	100,000	20,000	0	120,044	160,190	280,234
Forest	0	50	10,000	7,900	159,000	176,950	80,271	237,221
Franklin	0	49	45,000	15,000	0	80,049	100,595	180,644
Fulton	0	0	40,000	19,890	0	59,890	96,679	158,569
Greene	0	5,000	0	12,000	0	17,000	50,612	67,612
Huntingdon	0	100	114,300	23,906	0	138,306	273,881	412,187
Indiana	0	77	80,000	11,020	0	91,027	183,877	274,974
Jefferson	0	5,325	80,000	24,000	0	109,325	148,720	256,045
Juniata	0	5,000	50,000	10,000	0	85,000	73,938	138,938
Lackawanna	284	5,000	60,000	10,000	0	75,284	81,551	136,835
Lancaster	0	15	3,000	8,000	0	11,015	92,731	103,748
Lawrence	0	9,002	0	10,000	0	19,002	35,863	54,865
Lebanon	0	41	10,000	10,000	0	20,041	37,138	57,179
Lehigh	0	2,077	5,052	8,000	0	15,129	42,168	57,297
Luzerne	500	0	160,000	10,000	0	170,500	198,061	368,561
Lycoming	0	5,005	230,150	27,500	0	282,855	290,111	562,766
McKean	8,000	5,000	100,000	22,000	168,000	303,000	232,827	535,827
Mercer	0	3,000	19,500	5,000	0	27,500	90,639	118,139
Mifflin	0	2,500	65,000	11,233	0	78,733	60,579	139,312
Monroe	0	5,075	95,000	9,848	0	109,923	157,760	287,833
Montgomery	0	28	20,132	8,000	0	28,180	85,864	112,024
Montour	13	0	10,068	4,900	0	14,983	7,932	22,815
Northampton	0	47	20,077	4,500	0	24,624	40,145	64,769
Northumberland	45	0	30,000	8,000	0	38,045	81,170	119,215
Perry	0	5,045	75,000	10,000	0	90,045	121,924	211,989
Philadelphia	0	23	0	0	0	23	531	554
Pike	0	5,000	120,000	10,000	0	135,000	173,251	308,251
Potter	0	110	350,000	22,870	0	372,980	123,855	496,835
Schuylkill	0	5,050	145,000	20,000	0	170,050	141,232	311,282
Snyder	0	0	35,300	4,800	0	40,100	42,568	82,688
Somerset	0	240	120,000	20,000	0	140,240	198,335	338,575
Sullivan	0	0	90,000	43,000	0	133,000	103,335	236,335
Susquehanna	206	0	60,000	13,000	0	73,206	129,009	202,215
Tioga	0	55	190,000	13,400	0	203,455	168,703	372,158
Union	0	0	60,263	5,000	0	85,263	35,498	100,781
Venango	500	5,060	50,000	20,000	0	75,560	211,048	288,808
Warren	160	4,140	79,500	20,000	160,000	253,800	180,101	433,901
Washington	0	5,050	20,000	20,000	0	45,050	79,111	124,161
Wayne	45	0	70,484	8,000	0	78,529	168,452	248,981
Westmoreland	0	5,129	90,800	14,000	0	109,729	203,396	313,125
Wyoming	0	0	30,000	24,200	0	54,200	81,892	136,092
York	0	11	20,000	9,824	0	29,835	128,240	158,075
Total	17,832	171,962	4,729,221	1,041,617	600,300	6,560,932	8,238,893	14,799,825

NOTE: Forest County Private Forest Land reduced by 8,413 acres and pasture land increased by 8,413 acres from that in County Schedule submitted to Washington Planning Board.

FEDERAL ASSISTANCE

The water conservation benefits of the forests for power, navigation and irrigation on the headwaters of our inter-state streams, give the Federal Government a direct interest in reforestation and forest management. Already the Federal Government is:

- (1) Contributing toward the protection of State and private forests by a co-operative protection fund, Federal, State and private. This should be continued and somewhat enlarged.
- (2) Contributing toward the maintenance of state nurseries for the production of cheap reforestation stock. This should be continued.
- (3) Extending National forests by purchase of land. This should be completed within the boundaries agreed on in Pennsylvania. An additional 199,277 acres is needed to complete the Allegheny National Forest.
- (4) Purchasing sub-marginal farm lands for park purposes for development with relief funds or C.C.C. Camps and leased to the State. This should be continued and extended to lands for State Forest additions. The game land extension policy is well in hand and needs no Federal assistance.
- (5) Carrying on forest research from the Allegheny Forest Experiment Station located in Philadelphia, and investigating some forest problems from Pennsylvania, New Jersey, Delaware and Maryland. This scattering of effort of a small group of investigators over such a large territory is open to serious question. States are doing some of their own forest research, and lately State agricultural colleges and experiment stations are also entering this field. There is a question as to whether all this effort should not be merged under a system of State forest experiment stations

parallel to the State agricultural experiment stations with Federal coordination and supervision, but attached to the state forestry departments in those states where the state has accepted the dominant position and responsibility in forest land ownership and management.

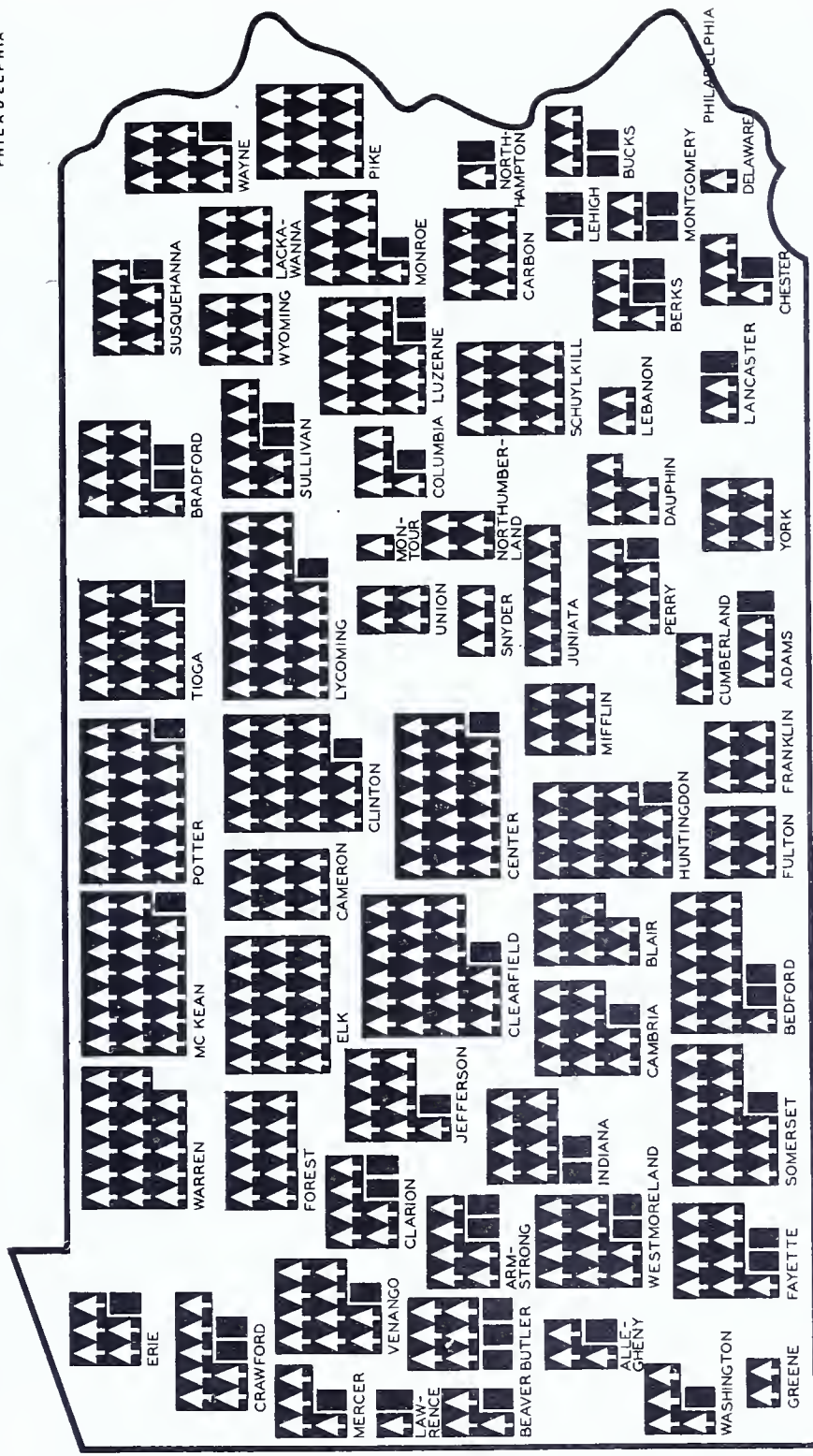
- (6) The Federal C.C.C. camps should be made a permanent feature for the development of our forests...

STATE FOREST PROGRAM

The State ownership of forest land may be divided into two parts according to present organization, (1) game lands, and (2) forest and park lands.

- (1) Game lands now have been purchased by the State to the extent of 440,286 acres. This report recommends the purchase of an estimated 601,331 acres additional. The fixed portion of the hunters' license fee available for land purchase permits the addition of about 75,000 acres of land annually at present prices to the State game land holdings. At this rate approximately eight years will see this plan completed.
- (2) The great problem is the financing of the State purchase of an additional 3,081,340 acres for the completion of the State Forest system. Part of this area is abandoned farm land which must be reforested. During a previous administration a bond issue was defeated, largely by the argument that the program could be financed by annual appropriations from current income and the payment of bond interest avoided. This plan has broken down, and unless an annual appropriation of one million dollars can be provided for the next twenty years, a bond issue should again be brought before the electorate.

New York is well along with a policy of abandoned farm land purchase and reforestation, for which a constitutional amendment authorizes the annual appropriation of one million



FORESTS

EXISTING AND POTENTIAL



EACH TREE = 25,000 ACRES EXISTING FOREST
EACH RECTANGLE = 25,000 ACRES POTENTIAL FOREST

dollars for 20 years. Forestry requires a continuous policy as free from temporary interruptions of political expediency as possible.

If the Federal government, in trying to permanently solve the problem of agricultural surplus, can finance the purchase of a part of the submarginal and abandoned farm land for park and forest use and lease them to the State under long term lease, such aid in the solution of the land problems of the State is recommended.

The State-wide forest protection system developed by the Department of Forests and Waters is getting results and should be continued. Federal, State and private cooperation should be continued.

The production in State nurseries of forest trees for economical reforestation by the government and private planters should be continued. The nurseries must be greatly extended, if the policy of State reforestation of abandoned farms and submargined farms is adopted on an adequate scale. To reforest 50,000 acres a year or 1,000,000 acres in 20 years-a minimum program for the combined private property owner and the state - will require a 60,000,000 tree output per year. Our forest nurseries now have facilities for but 12,000,000 to 15,000,000 output.

Since the present State forest lands are now reaching an age when large scale marketing of thinnings is necessary, the State should establish a special fund for the proceeds of such

thinnings, from which the cost of making them may be paid. An appropriation of perhaps \$100,000 would start this special fund. It was only the existence of such a special fund that permitted the self-supporting salvage of 35,000 cords of blighted chestnut from the Mont Alto State Forest (1920-27) with proceeds of about \$200,000. This special fund was legislated out of existence with other special funds, without a consideration of its special merit.

FOREST RESEARCH

The Department of Forests and Waters, with its problems of technical management of highly complex natural forest stands, and in its extensive reforestation problems, and also in the problem of finding markets for its wood crop now approaching harvest in the first stage, must carry on a continuous series of practical experiments as well as basic forest research. Its needs are pressing and it cannot wait for the efforts of more remote forest agencies, interested often in different problems, to come to its assistance. For this reason the Department long has had a Bureau charged with forest research, and centralized at the Mont Alto Forest and Nursery, though the experimental work is as State-wide as the State forest lands.

The interest of the Department of Forests and Waters is paramount and its State Forest Research Institute should be continued. Merging should be considered only if a National system of State forest experiment stations is established with the local administration of such a State forest experiment station

associated with the State forest administration. Forest administration and research are inseparable. The Department of Forests and Waters holds the responsibility for leadership in reforestation. It should establish demonstration forest areas in each county situated in accessible places for the inspection and encouragement of private forest owners in reforestation and forest management.

Such abandoned farm land, reverting to the counties for non-payment of taxes, as can be attached to and economically administered by established State Forests should be so administered. But there will remain smaller scattered blocks which might well be put under permanent forest administration by some of the counties themselves. Enabling legislation now exists for this. The State should subsidize the reforestation of such county forests and furnish professional consultation in their reforestation and management as New York State is now doing.

EXTENSION OF PARK AND RECREATIONAL LANDS

An accompanying table shows that there is a total of 94,946 acres of land devoted to park and recreation purposes, including an estimated 52,400 acres privately owned, most of the latter in golf courses. While the State Forests and Game Lands are open to visitors everywhere (game refuges excepted) and are to a degree a vast system of State recreational lands, they are often not advantageously placed for park and recreational use.

PRESENT PARK AND RECREATION LAND OWNERSHIP IN PENNSYLVANIA
(All Figures in Acres)

	GOVERNMENT OWNED				Total	Privately	Total
	Municipal	County	State	Federal	Public	Owned	
Adams	0	0	5	1,200	1,205	100	1,305
Allegheny	2,028	4,010	0	0	6,038	10,000	16,038
Armstrong	0	0	0	0	0	300	300
Beaver	21	0	0	0	21	200	221
Bedford	0	0	15	0	15	100	115
Berks	835	0	25	0	860	400	1,260
Blair	59	0	0	0	59	250	809
Bradford	0	0	0	0	0	150	150
Bucks	0	0	765	0	765	1,000	1,766
Butler	0	0	0	0	0	500	500
Cambria	435	0	0	0	435	500	935
Cameron	0	0	109	0	109	50	159
Carbon	3	0	0	0	3	500	503
Centre	0	0	887	0	887	300	1,187
Chester	10	0	1,500	0	1,510	5,000	6,510
Clarion	0	0	3,958	0	3,958	200	4,158
Clearfield	0	0	330	0	330	100	430
Clinton	11	0	229	0	240	100	340
Columbia	0	0	0	0	0	200	200
Crawford	42	0	4,414	0	4,456	500	4,956
Cumberland	87	0	410	0	497	300	797
Dauphin	106	0	1	0	107	1,500	1,607
Delaware	119	0	0	0	119	1,600	1,619
Elk	0	0	16	0	15	100	116
Erie	219	0	3,000	0	3,219	500	3,719
Fayette	0	0	234	0	234	600	734
Forest	0	0	1,927	0	1,927	50	1,977
Franklin	0	0	388	0	386	300	686
Fulton	0	0	15	0	15	60	65
Greene	0	0	0	0	0	200	200
Huntingdon	8	0	517	0	625	100	626
Indiana	3	0	0	0	3	300	303
Jefferson	0	0	193	0	193	300	493
Juniata	0	0	4	0	4	100	104
Lackawanna	226	0	0	0	226	600	726
Lancaster	319	0	0	0	319	500	819
Lawrence	387	0	0	0	387	600	887
Lebanon	0	0	1	0	1	600	601
Lehigh	495	0	0	0	496	1,000	1,496
Luzerne	373	0	0	0	373	500	873
Lycoming	180	0	37	0	217	2,300	2,617
McKean	6	0	0	0	6	100	108
Mercer	6	0	0	0	6	200	206
Mifflin	0	0	48	0	48	100	148
Monroe	0	0	8	0	8	2,000	2,008
Montgomery	96	0	0	0	96	5,000	6,096
Montour	0	0	0	0	0	200	200
Northampton	249	0	36	0	284	1,000	1,284
Northumberland	10	0	0	0	10	200	210
Perry	0	0	134	0	134	100	234
Philadelphia	8,353	0	0	0	8,353	6,000	13,353
Pike	0	0	1,209	0	1,209	2,000	3,209
Potter	0	0	106	0	106	100	206
Schuylkill	1	0	0	0	1	1,000	1,001
Snyder	0	0	452	0	452	100	552
Somerset	0	0	56	0	56	200	266
Sullivan	0	0	27	0	27	300	327
Susquehanna	0	0	0	0	0	100	100
Tioga	0	0	281	0	261	100	361
Union	0	0	468	0	468	200	668
Venango	45	0	0	0	45	200	245
Warren	130	0	0	0	130	150	280
Washington	6	0	0	0	8	500	608
Wayne	0	0	0	0	0	500	500
Westmoreland	143	0	477	0	620	500	1,120
Wyoming	0	0	0	0	0	200	200
York	68	0	0	0	68	300	368
Total	15,078	4,010	22,268	1,200	42,546	52,400	94,948

Another table indicates for the future there should be an increase of 144,239 acres in publicly owned park and recreation lands. This would bring such lands publicly owned up to 20 acres per 1000 inhabitants. With a moderate increase in private recreational lands of 7,877 acres, an additional 5 acres per 1000 inhabitants would be available largely in golf courses, ball parks, etc. These figures seem large, but probably half of the recommended increase in State owned recreational and park land will be set aside for this special use as the State Forests and Game Lands are built up to the point indicated in this plan. This agrees with the recommendation of the Greater Pennsylvania Council that the special public park areas should total about 10 acres per 1000 inhabitants and these parks should be located within a 30 to 60 mile radius of the population to be served. With the rapidly increasing speed and facility for transportation, probably the 60 mile radius may be used, as it offers a more adequate choice of natural park areas.

The suggested increases in State parks include such projects (for further investigation) as:

<u>Park Project</u>	<u>Area</u> (acres)	<u>County</u>
Blanket Hill	1,500	Armstrong
Sinking Valley	2,500	Blair
Haycock Mountain	4,000	Bucks
McConnells Mills	8,000	Butler
Sinking Valley	2,500	Cambria
Buck-tail	6,650	Cameron
Warwich Twp.	26,000	Chester
Buck-tail	4,000	Clearfield

RECOMMENDED FUTURE PERMANENT PARKS AND RECREATION LAND OWNERSHIP
(All Figures in Acres)

	GOVERNMENT OWNED				Total Public	Private Owned	Total Parks Recreation
	Municipal	County	State	Federal			
Adams	0	0	200	1,200	1,400	105	1,505
Allegheny	2,028	6,010	0	0	8,038	10,000	18,038
Armstrong	300	0	600	0	900	900	1,800
Beaver	669	0	0	0	669	800	1,469
Bedford	0	0	230	0	230	100	330
Berks	835	0	325	0	1,160	600	1,760
Blair	150	0	2,200	0	2,350	459	2,809
Bradford	0	0	100	0	100	150	250
Bucks	0	0	4,785	0	4,785	1,000	5,785
Butler	0	500	7,000	0	7,500	1,000	8,500
Cambria	435	0	2,500	0	2,935	500	3,435
Cameron	0	0	6,759	0	6,759	50	8,809
Carbon	3	0	500	0	503	500	1,003
Centre	0	0	987	0	987	300	1,287
Chester	510	0	27,500	0	28,010	4,500	32,510
Clarion	0	0	3,958	0	3,958	700	4,658
Clearfield	0	0	4,230	0	4,230	200	4,430
Clinton	10	0	20,230	0	20,240	100	20,340
Columbia	0	300	0	0	300	200	500
Crawford	42	0	4,414	0	4,456	500	4,956
Cumberland	87	0	910	0	997	300	1,297
Dauphin	106	0	501	0	607	1,500	2,107
Delaware	119	0	1,000	0	1,119	1,500	2,619
Elk	0	0	215	0	215	100	315
Erie	219	0	3,500	0	3,719	500	4,219
Fayette	0	0	1,234	0	1,234	500	1,734
Forest	0	0	1,927	0	1,927	550	2,477
Franklin	0	0	786	0	786	300	1,086
Fulton	0	0	315	0	315	50	365
Greene	0	0	0	0	0	500	500
Huntingdon	8	0	817	0	825	100	925
Indiana	3	0	500	0	503	300	803
Jefferson	0	0	393	0	393	400	793
Juniata	0	0	304	0	304	100	404
Lackawanna	0	0	926	0	926	800	1,726
Lancaster	319	0	500	0	819	500	1,319
Lawrence	387	0	500	0	887	500	1,387
Lebanon	0	0	501	0	501	500	1,001
Lehigh	495	0	1,000	0	1,495	1,000	2,495
Luzerne	373	0	500	0	873	627	1,500
Lycoming	180	0	2,337	0	2,517	500	3,017
McKean	8	0	0	0	8	400	406
Mercer	6	0	500	0	506	200	706
Mifflin	0	0	248	0	248	200	448
Monroe	0	0	4,008	0	4,008	2,000	6,008
Montgomery	95	0	2,000	0	2,095	5,000	7,095
Montour	0	0	500	0	500	200	700
Northampton	249	0	1,000	0	1,249	1,035	2,284
Northumberland	10	0	500	0	510	200	710
Perry	0	0	1,933	0	1,933	124	2,057
Philadelphia	13,353	0	0	0	13,353	10,000	23,353
Pike	0	0	2,157	0	2,157	2,052	4,209
Potter	0	0	606	0	606	100	706
Schuylkill	1	0	7,000	0	7,001	1,000	8,001
Snyder	0	0	327	0	327	525	852
Somerset	0	0	5,056	0	5,056	200	5,256
Sullivan	0	0	6,027	0	6,027	300	6,327
Susquehanna	0	0	500	0	500	100	600
Tioga	0	0	611	0	611	100	711
Union	0	0	2,468	0	2,468	200	2,668
Venango	0	0	348	0	348	400	748
Warren	130	0	500	0	630	150	780
Washington	106	0	12,900	0	13,006	500	13,506
Wayne	0	0	500	0	500	500	1,000
Westmoreland	143	0	1,477	0	1,620	500	2,120
Wyoming	0	0	500	0	500	200	700
York	88	0	500	0	568	300	868
Total	21,445	6,810	157,330	1,200	186,785	60,277	247,062

Buck-tail	20,000	Clinton
Pine Grove Furnace	500	Cumberland
In Philadelphia and vicinity	10,000	Philadelphia
Clarks Valley	7,000	Schuylkill
To be named	5,000	Somerset
Ricketts Glen	6,000	Sullivan
Ten Mile Run	13,000	Washington

The accompanying figure¹ shows the location of some of these proposed State park areas and existing park areas, with their relation to population density, on a State map.

The Federal government is disposed to make a material contribution to this advanced program by the purchase of several park areas close to the metropolitan areas, develop them with relief funds or C.C.C. camps and then lease them to the State Department of Forests and Waters for administration as State parks.

For financing the State's share of this program, a special item should be added to the Department of Forests and Waters land purchase appropriation, or bond issue, if the latter is resorted to. An annual appropriation of \$100,000 would seem adequate for the first years in launching this greater State Park Plan.

Some expansion of county parks may be feasible, though recreational land use knows no county lines and is more especially a state interest.

¹ Adapted from "An Outline of a Balanced State Park System" by Joseph Talmage Woodruff of the former Greater Pennsylvania Council.

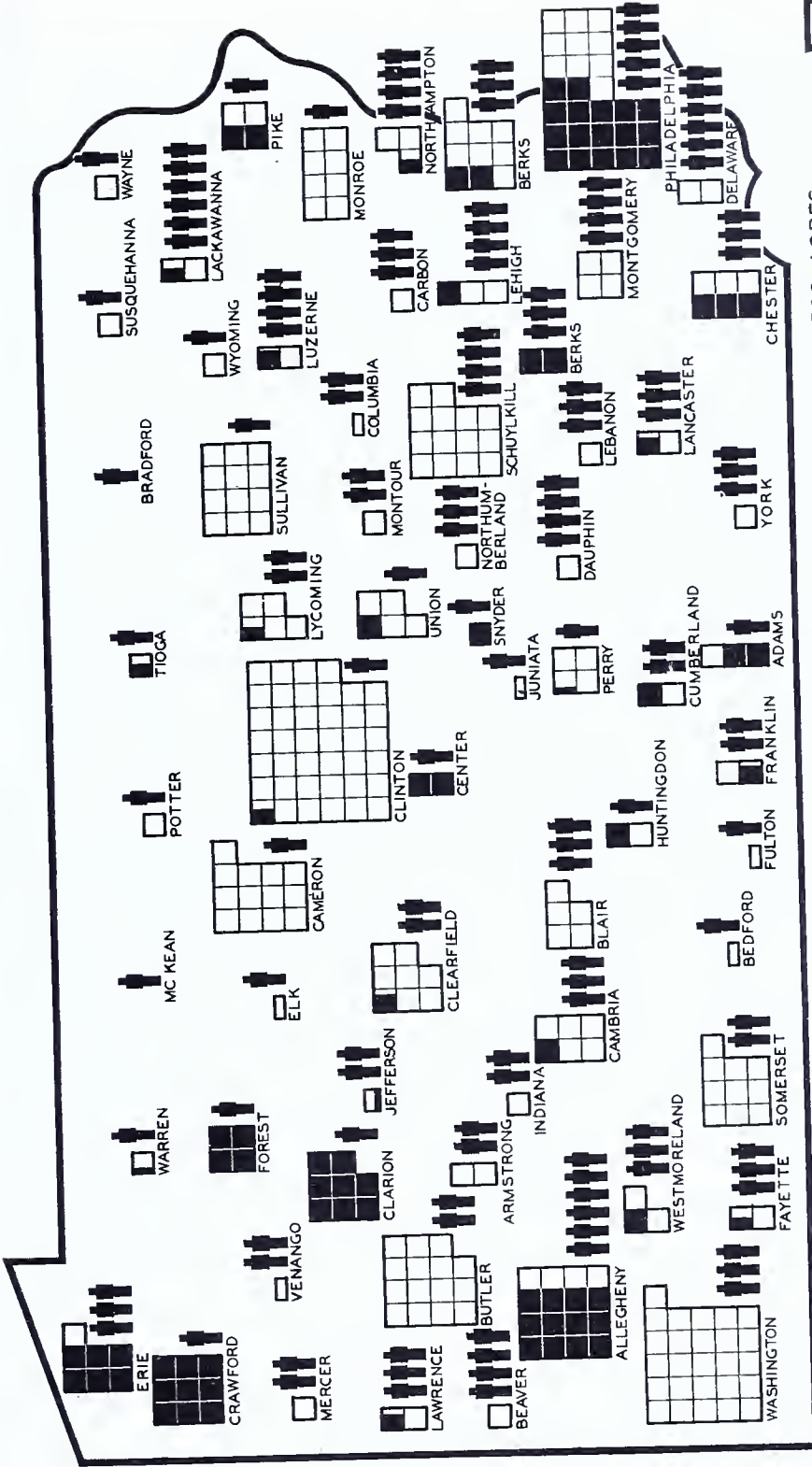
SUMMARY OF LAND USE PLAN

(1) The forest provides social services for our citizens, which in time may exceed its much needed wood crops in value. These services include, to restate the more important ones, water conservation in all its forms-domestic supply, power, irrigation, regulation of stream flow, and protection of navigation channels; soil erosion; climatic influence; hunting, fishing and recreation.

Private ownership has failed to grow new crops of wood after it exploited the virgin timber. It has failed to maintain a forest cover adequate to furnish the above social services. It is now abandoning large areas of forest land and submarginal agricultural land for taxes. Public forest ownership must be greatly extended to protect the paramount public interest involved.

(2) Pennsylvania normally consumes 858,000,000 cubic feet of forest grown wood each year. It grows only 379,000,000 cubic feet. It must purchase outside and ship in 56 per cent of its wood needs for its industries and home consumption. There is a home market for all the wood our forest land, plus the already abandoned farm land and the sub-marginal farms to be abandoned, can produce if fully reforested and properly managed.

(3) The present forest area of about 13,000,000 acres must be increased by the addition of these starvation farm lands to above 16,000,000 acres. There must be a further



PRESENT AND PROPOSED PARK AREAS
IN RELATION TO POPULATION

EACH SQUARE = 500 ACRES
■ PRESENT □ PROPOSED
FIGURES SHOW POPULATION DENSITY

shift in ownership. The State must add over 3,000,000 acres to the 1,600,000 now in State Forests, replanting perhaps a million acres of this added area.

The State must add an estimated 600,000 acres to its game lands bringing that forest land holding to about one million acres.

This extending of State forest lands will assist mightily in the reorganization and consolidation of local government units and school districts advocated elsewhere in this report.

The Federal government plans to add 200,000 acres to the Allegheny National Forest to attain its goal of 600,000 acres.

The counties are permitted by law to set up county forests from their county owned tax-forfeited lands. They should be counted on to handle between 100,000 and 200,000 acres with State aid in their reforestation and management.

This program calls for a total increase of public ownership of 4,000,000 acres of land now under unsatisfactory forest cover, or in already abandoned plus active but submarginal farms.

(4) The park lands of the State should be increased 144,000 acres, generally as State Parks. Public parks no longer serve only local populations.

(5) The game interests have already worked out their land program. They are adding 75,000 acres annually to the State's holdings for wild life refuges and public shooting grounds. The program is financed by the hunters, without asking for tax money

and should be completed in 8 years. This portion of the plan needs but to be let alone.

The Federal government has its National Forest already two-thirds complete and is proceeding on the last third. This requires only the support of our Members of Congress at Washington.

Only the State Forest (and the minor county forest) and State Park programs are lagging. Since the defeat of a bond issue, the alternative is to make a State appropriation of \$1,100,000 a year for 20 years to carry out this essential part of the State land use program. This need must be classed in importance with the state support of schools and welfare institutions. Thus far building up the State Forest and Park system has been regarded only as a project for surplus funds in prosperous periods. It must become an established policy like the game development which has already shown the Nation what a steady year by year planned policy can accomplish.

The Federal government is offering some little aid by purchasing submarginal farm lands and leasing them to the State for State Parks and State Forests.

(6) Minor points in the forest plan call for

- (a) Continued Federal financial cooperation in forest fire protection and in State forest nursery support.
- (b) Continued forest development by the Federal conservation corps.
- (c) More adequate support of forest research by Federal and State agencies.

- (d) A system of county demonstration, reforestation and forest management areas should be established as a practical help to private land owners. To start this at once the Federal government might be interested in buying submarginal land and leasing it to the State.

WATER RESOURCES*

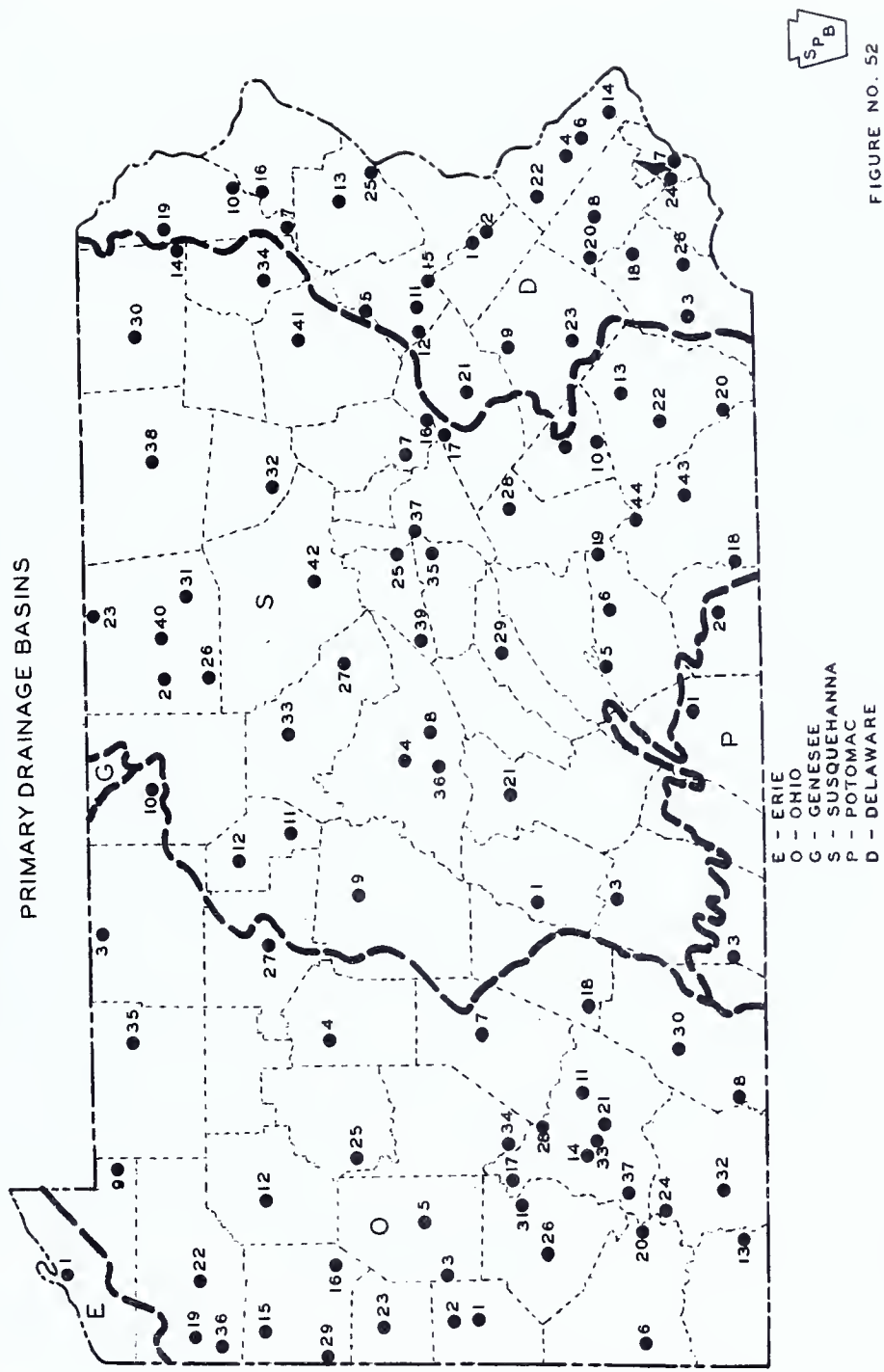
Pennsylvania is divided topographically and hydrographically into six drainage basins, three of which are further divided into sub-basins presenting in its watershed the divides between the Atlantic Ocean, the Gulf of Mexico and the Great Lakes drainage systems. The most important river systems are the Delaware in the east, the Susquehanna in the center and the Ohio in the west. The Potomac River drains a comparatively small area in the middle south, while in the northwest there is a small area draining into Lake Erie. In the extreme northern central part of the State, the Genesee River System drains northwardly into Lake Ontario.

Precipitation

General and systematic observations of rain and snowfall were not begun in Pennsylvania until 1887. In 1915 the Water Supply Commission, (now known as the Water and Power Resources Board, a unit of the Department of Forests and Waters) collected all available rainfall records. These were analyzed and all that appeared authentic and of value were published. At present there are about 190 precipitation stations, or an average of one station for each 258 square miles of area. The United States Weather Bureau operates 135 stations; 40 are maintained by the Department of Forests and Waters and 15 by private in-

*Reduced from a larger report by Charles E. Ryder, C.E., Chief Engineer Water Resources Service, Department of Forests and Waters.

PRECIPITATION STATIONS AND PRIMARY DRAINAGE BASINS



PENNA. DEPARTMENT OF FORESTS & WATERS

FIGURE NO. 52

terests.

The average annual precipitation for the 46-year period, 1883 to 1933 inclusive, was 42.29 inches. Within this period the maximum recorded yearly rainfall for the State as a whole was 52.67 inches in 1889, and the minimum 28.82 inches in 1930.

Precipitation data are valuable in connection with the investigation of all forms of utilization of water resources, particularly where direct measurements of stream flow are lacking. In some parts of the United States it is difficult to trace relationship between precipitation and runoff, but climatic conditions in Pennsylvania permit practical use of rainfall records. Although the rainfall stations in Pennsylvania are fairly well distributed, additional stations are needed at particular localities where data are now lacking. It is believed that 40 additional stations should be established as soon as possible.

There are 26 precipitation stations in the Delaware Basin; 43 in the Susquehanna Basin; 38 in the Ohio Basin; 1 in the Erie and 3 in the Potomac Basins.

HYDROGRAPHIC DATA

Surface Runoff

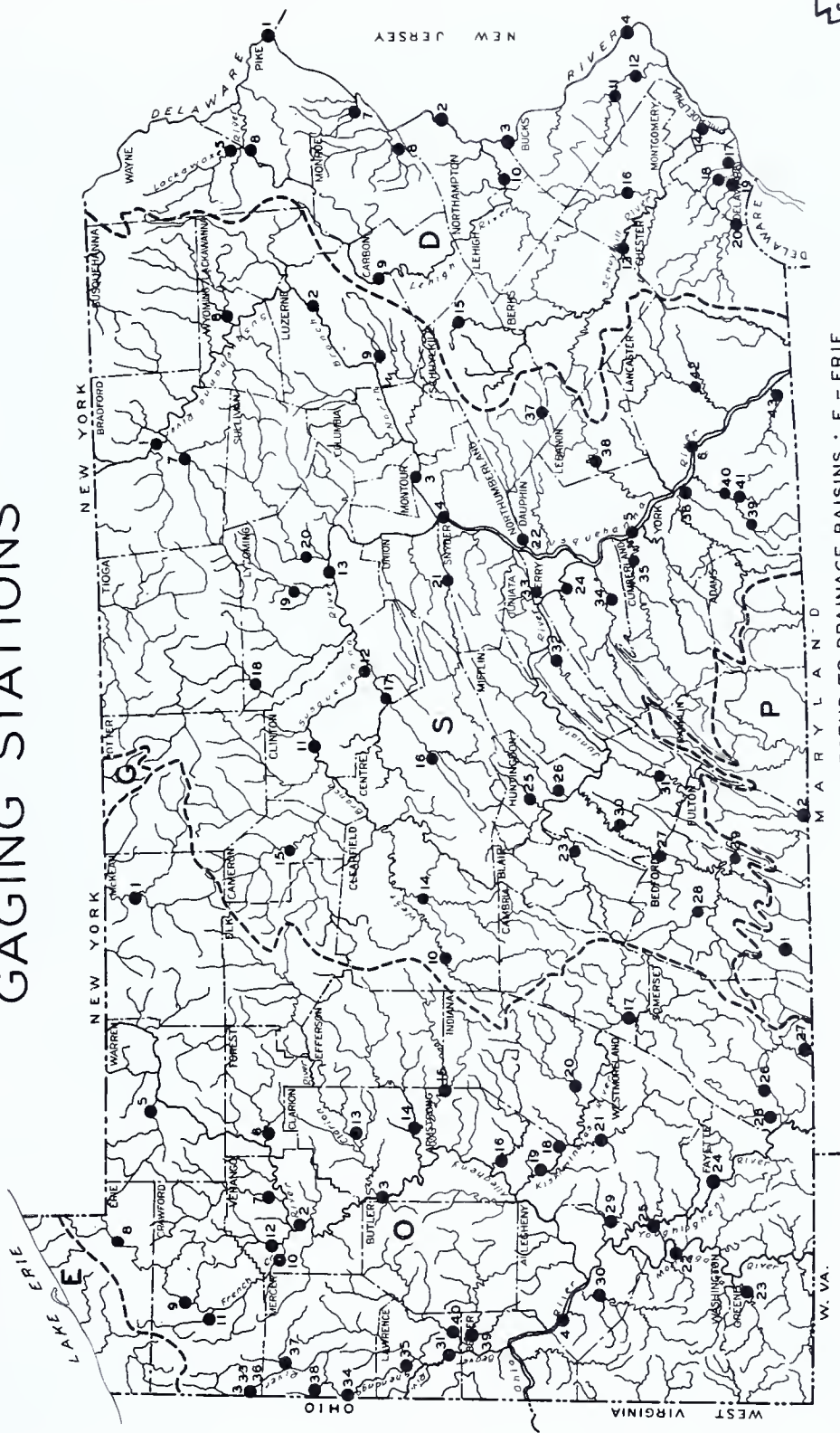
No comprehensive plan for water conservation can be carried out without reliable basic information concerning the behavior of streams over a long period of years. Work of this kind was begun shortly after the creation of the Water Supply

Commission in 1905 and is now being carried on by the Water and Power Resources Board in cooperation with the United States Geological Survey. It includes not only the operation and maintenance of 96 permanent gaging stations, but also a collection of stream flow data on miscellaneous streams during times of droughth and floods. At present 37 permanent stations are located in the Ohio River, 40 in the Susquehanna, 16 in the Delaware, and three in the Potomac basins.

The development of this form of water resources investigation has been gradual and possibly has not kept pace with the needs for such data. Requests are constantly being received for hydrographic information on streams which are not being gaged. In such cases it is necessary to make long range deductions, using records of other streams in which conditions may not be entirely similar, so that the results are very often misleading. A more complete knowledge of runoff characteristics of certain important streams is desirable by extension of the stream gaging program.

Up to date, 52 gaging stations have been provided with self-recording equipment. This means that 41 of the stations are supplied with only chain or staff gages. At least one half of such stations are located on important streams where dependable recording equipment should replace the present non-recording gages. Not less than 25 additional stations should be established and maintained, with major efforts directed to streams of small drainage areas. Weirs are needed as control

GAGING STATIONS



LEGEND TO DRAINAGE BASINS : E - ERIE
O - OHIO
G - GENESSEE
S - SUSQUEHANNA
P - POTOMAC
D - DELAWARE

PENNA. DEPARTMENT OF FORESTS & WATERS

sections at many gaging stations because of continual shifting channel conditions.

There are twenty gaging stations in the Delaware Basin, forty-three in the Susquehanna Basin, two in the Potomac Basin and forty in the Ohio Basin. In the first group four are at communities along the Delaware River from Port Jervis, N.Y. to Trenton, N.J. Two each are located along the Schuylkill and Lehigh Rivers and others along the principal creeks tributary to these streams. In the Susquehanna Basin, the distribution is along the Susquehanna, its branches and tributaries and in the Ohio along the Allegheny and its tributaries.

The following table gives basic information with respect to the average rates of runoff in the streams in various parts of the State:

AVERAGE DISCHARGE
(Cubic feet per second per square mile)
(Stations with records of 10 years or more)

OHIO BASIN

Station	Drainage Area	Total years of record	Average discharge c.s.m.
Allegheny River at Franklin	5,982	15	1.63
Blacklick Creek at Blacklick	390	26	1.71
Brokenstraw Creek at Youngsville	304	19	1.83
Casselman River at Markleton	382	13	1.60

Station	Drainage Area	Total years of record	Average dis- charge c.s.m.
Chartiers Creek at Carnegie	264	12	1.30
Connoquenessing Creek at Hazen	356	14	1.38
Crooked Creek near Ford City	280	22	1.59
Cussewago Creek near Meadville	90.2	23	1.44
French Creek at Carters Corners	208	17	2.04
French Creek at Saegertown	629	12	1.69
Kiskiminitas River at Avonmore	1,723	26	1.75
Laurel Hill Creek at Ursina	121	17	2.27
Little Shenango River at Greenville	105	13	1.36
Loyalhanna Creek at New Alexandria	265	10	1.69
Mahoning Creek near Dayton	321	13	1.76
Pymatuning Creek near Orangeville	169	15	1.28
Redbank Creek at Saint Charles	528	20	1.70
Shenango River near Jamestown*	181	13	1.24
Shenango River at New Castle	792	23	1.14
Shenango River at Sharon	608	23	1.17
Slippery Rock Creek at Wurtemburg	406	20	1.38
Stony Creek at Johnstown	467	19	1.69
Turtle Creek at Trafford	54.8	13	1.46
Youghiogheny River at Connellsville	1,326	24	1.88
Youghiogheny River at Sutersville	1,715	13	1.63

SUSQUEHANNA BASIN

Clearfield Creek at Dimeling	371	20	1.58
Driftwood Branch Sinnemahoning Creek at Sterling Run	281	14	1.61
Frankstown Branch Juniata River at Williamsburg	291	14	1.32
Juniata River at Newport	3,354	32	1.34
Lycoming Creek near Trout Run	173	16	1.54
North Bald Eagle Creek at Beech Creek Station	559	23	1.45
North Bald Eagle Creek at Milesburg	119	18	1.82
North Branch Susquehanna River at Danville	11,220	30	1.35
North Branch Susquehanna River at Towanda	7,797	15	1.28
North Branch Susquehanna River at Wilkes-Barre	9,960	34	1.37
Pine Creek at Cedar Run	604	14	1.22

*Station discontinued July 1934

Station	Drainage Area	Total years of record	Average dis- charge c.s.m.
Raystown Branch Juniata River at Saxton	756	22	1.26
Susquehanna River at Harrisburg	24,100	43	1.45
Swatara Creek at Harper Tavern	333	14	1.62
Towanda Creek near Monroeton	214	15	1.39
Tunkhannock Creek at Dixon	383	15	1.42
Tuscarora Creek near Port Royal	214	22	1.23
Upper Little Swatara Creek at Pine Grove	34.3	12	1.55
Wapwallopen Creek near Wapwallopen	45.8	13	1.33
West Branch of Susquehanna River at Bower	315	20	1.80
West Branch of Susquehanna River at Renovo	2,975	21	1.62
West Branch of Susquehanna River at Williamsport	5,682	38	1.58
Brandywine Creek at Chadds Ford	287	22	1.29
Bushkill Creek at Shoemakers	117	21	2.02
Delaware River at Belvidere, N.J.	4,540	11	1.72
Delaware River at Riegelsville	6,340	27	1.70
Delaware River at Port Jervis, N.Y.	3,070	28	1.81
Delaware River at Trenton, N.J.	6,800	20	1.66
Lehigh River at Tannery	322	14	2.12
Little Schuylkill River at Tamaqua	42.9	15	2.24
McMichaels Creek at Stroudsburg	64.4	20	1.86
Schuylkill River at Philadelphia	1,893	11	1.29
Wallenpaupack Creek at Wilsonville	228	17	1.70

Ground Water

In some parts of the country ground water is the most valuable natural resource, but it is only within recent years that its importance has been recognized.

From 1912 to 1918, during the preliminary investigations and surveys for the Pymatuning Reservoir Project in north-western Pennsylvania, observations were made at 40 wells. Since 1931, about 33 wells have been observed weekly around the margin of the reservoir. The purpose in collecting these

records was to determine the influence of ground water on stream flow. In the fall of 1931, 32 wells in the vicinity of stream gaging stations distributed in the Ohio, Susquehanna and Delaware basins were selected for ground water observation, and weekly records showing the ground water fluctuations have been obtained since that time. The study has been going on for too short a period to make any conclusive statements concerning the results.

Ground water observations should be continued and a large number of additional wells should be driven and maintained.

Droughts

Droughts may be divided into two classes; the first occurring when the rainfall is inadequate to satisfy the growing crops although the streams are kept near normal stages by ground water flow; and the second when neither the previous ground conditions nor the rains are sufficient to maintain normal ground and surface flows. The former affects chiefly the crops, while the latter affects water supplies.

Authentic records of droughts during past years are scarce and conflicting, as the beginning of such periods are not well marked and the State has not been subjected to such frequent and devastating dry spells as in some other parts of the country. However, ten noteworthy ones have been experienced during the last 56 years, but there are no records to show that any of them were accompanied by losses and inconveniences to popula-

tion and industry equal to that of 1930.

The unprecedented drought of 1930 covered the period July to December inclusive. At the end of June there was an accumulated deficiency in precipitation of five inches over about one-fourth of the State, and during the following four months, covering the growing period, the deficiencies increased in the dry regions to 15 inches and to 10 inches on fully three-fourths of the State. The average deficiency for Pennsylvania during those four months was over eight inches or less than one-half the normal amount.

For the State as a whole, the mean precipitation in 1930 was 28.82 inches as compared with a normal yearly of 42.29 inches. The deficiency in 1930 was equivalent to one-third of the usual amount, with the nearest approaching condition in 1895 when it was one-fifth of the normal.

During this drought water supplies from small streams and ponds, shallow wells and thousands of springs became exhausted. Conditions became so accute in some localities that it was necessary to use mine water, while in others resort was had to water that had collected in abandoned quarries. Consequently, restrictions were placed on the use of water in many localities. Water supplies failed in August in some sections of the State, and at one municipality waste condensor water was pumped into the distribution system at a temperature of 125 degrees.

Water power outputs were below anticipated minimum productions. Slightly more than two-thirds of the usual electric

output by public utilities in Pennsylvania, normally generated by water power, was furnished by hydro-electric plants in 1930. Forestry suffered great losses through lack in tree growth, by the dying of trees and destructive fires which numbered 3,700 more than were ever known in any previous year. Fish life was exterminated in many streams and food for wild life was scarce and of inferior quality.

The distribution of rainfall for the growing seasons of 1931 and 1932 was in most sections favorable to plant life. So far as vegetation was concerned, the drought ended with the growing season of 1931, but as related to water supply the effects of that drought were still being felt in the fall of 1932. It was the marked and long continued deficiency in stream flows and extremely low ground water levels that made the 1930 drought outstanding. From August 1930, to March 1931, the lowest monthly flows for each of the eight consecutive months were observed in many Pennsylvania streams.

Droughts are important not as isolated freaks of climatic conditions but as menaces that are virtually certain to recur. Future planning for the many uses of water must be based on a thorough realization of this fact. If supplies are to be adequate, full provision must be made for a recurrence at any time and allowance must be based upon a complete statistical knowledge of what has happened.

Natural Lakes and Ponds

Information concerning lakes and ponds exceeding 20 acres

in extent is published in Part IV of the Water Resources Inventory Report. Two hundred and ninety-three lakes were surveyed with 254 exceeding 20 acres each in area. Conneaut Lake in Crawford County is the largest natural lake, with an area of 928.5 acres. The second in size is Harvey Lake in Luzerne County, with a water surface of 658.6 acres. There are 17 others in the State exceeding 200 acres each. Four hundred and twenty-four lakes and ponds are listed in the publication, with a total surface area of over 23,530 acres.

The natural lakes and ponds of Pennsylvania are comparatively small and although they are found in considerable numbers, are used principally as pleasure resorts or in some cases as sources of ice supply for rural districts.

Conservation by Storage

There are in Pennsylvania about 870 storage reservoirs, either built or building, each with a capacity of 1,000,000 gallons or more. The aggregate drainage area about these reservoirs is 10,900 square miles, or an average drainage area for each reservoir of about 12.5 square miles. The total storage is 238 billion gallons, or an average of about 275 million gallons for each reservoir. Two reservoirs, Lake Wallenpaupack, in Pike and Wayne counties, and the Pymatuning Reservoir, in Crawford County, have a combined capacity of 133,000,000,000 gallons, or 56 per cent of the total. Lake Wallenpaupack has the greatest capacity, 70,000,000,000 gallons, although its water surface area of 5,760 acres is but slightly more than one-

third of that of the Pymatuning Reservoir, which has an area of 16,400 acres and a capacity of 63,000,000,000 gallons.

The drainage area about Lake Wallenpaupack is 227 square miles, while that above Pymatuning is 160 square miles. Disregarding these two reservoirs, which have capacities for exceeding those of any others in the State, the average storage per reservoir is about 120,000,000 gallons.

The importance of storage for conserving water and regulating stream flow is usually not fully appreciated nor understood. Without such regulation, the dependable amount of water which may be obtained from a stream for water supply purposes is limited to the minimum flow prevailing during the driest months. Low flows during the warm summer season likewise govern the design of works for the treatment of sewage and trade wastes and determine the sanitary quality of a stream. Water power developments require dams to create working head and to equalize the stream flow, although the combination of steam and hydro-electric plants materially increases the average rate of stream discharge which may be put to useful work.

In the case of the typical unregulated stream, probably less than five per cent of the total yearly runoff can be said to be useful and dependable for water supply purposes. It is possible, with storage reservoirs, to increase a stream's usefulness all the way through the range from minimum flow to practically 100 per cent of the yearly yield, depending upon the availability of storage reservoir sites and

LAKE ERIE



DEPARTMENT OF FORESTS & WATERS

depending upon the extent to which such sites may be economically developed.

The variation in rain and snowfall from year to year in any given locality covers a wide range and is a governing factor in determining stream flow and its usefulness for water supply purposes. There may be successive years of deficiency in precipitation resulting in depletion of ground water storage, thus causing streams to fall far below the average. It is periods such as these which must be considered in determining how much water may be counted on for meeting the needs for domestic, municipal and industrial supplies.

The rate of discharge of a stream is a function not only of the rainfall but also of the topographical, geological and other physical characteristics of the watershed and of the size of the drainage basin. We know that certain streams may dry up entirely during long continued periods of warm weather with little rain, and that other streams in glaciated country appear to be dry because the entire flow is passing beneath the surface of the gravel stream beds. We may then have a range varying between zero flow for certain classes of streams of small size to comparatively high summer flows for those streams draining forested mountainous areas and areas underlain with limestone where the underground storage is large. It is not possible to make a general statement with respect to how much water may be obtained from a stream of any given size without storage regulation, and the smaller the stream the more diffi-

cult it is to make such estimate. In the case of particular streams, however, fairly accurate estimates can be made if the flows have been measured over a long period at reliable gaging stations. Less accurate estimates of safe and dependable yields of certain streams can be obtained by comparing them with streams having similar physical characteristics on which stream gaging stations are located.

For the purpose of illustrating the value of storage, let us assume that a water supply is to be obtained from a mountain stream having a drainage area of 10 square miles. If only an intake is built in the stream, the dependable yield cannot exceed the low flows of drought seasons. A fair estimate of the minimum flow would be 0.05 cubic feet per second per square mile, or 323,000 gallons per 24 hours total supply. This would be sufficient for a town of 3230 inhabitants at a per capita consumption of 100 gallons per day. If this same stream contained a suitable site for a dam so that it could be completely regulated by a storage reservoir of 3 or 4 billion gallons capacity, the safe yield would probably be about one million gallons per square mile of drainage area, or a total of 10 million gallons per 24 hours, a supply adequate for a city of 100,000 population. New York City is planning to obtain 440 million gallons of water a day from tributaries of the Upper Delaware River having a drainage area of 440 square miles. Large storage reservoirs will make this possible and also provide for releasing compensation water to augment the flow of the main

Delaware River during dry seasons of the year when the flow at Port Jervis or Trenton falls below a certain specified amount.

As another illustration of the effectiveness of storage there may be cited the effect of the Pymatuning Reservoir in regulating the flow of the Shenango River at Sharon. During August, 1930, the average flow at Sharon was 13.5 cubic feet per second, or 8,725,000 gallons per 24 hours, and during September of the same year the average daily flow amounted to 11,370,000 gallons. With the reservoir in operation, the summer flow will be maintained at not less than 400 cubic feet per second, or 258,000,000 gallons per 24 hours, almost 30 times the low monthly flows now experienced.

INDUSTRIAL WATER SUPPLY

Consumption

It is estimated that the industrial consumption of water in Pennsylvania is 2 billion, 500 million gallons daily. Many steel, iron, coal companies and other industrial plants use large quantities of water and pump directly from the large rivers if conveniently located. At Johnstown, the Bethlehem Steel Company secures its principal supply from large storage reservoirs on tributaries on the Conemaugh River. One, on Hinckstown Run in Johnstown, has a capacity of one billion, 124 million gallons; the other on Quemahoning Creek, the largest water supply reservoir in the State, holds 12 billion gallons. Water is also diverted from the Little Conemaugh River, several miles east of the city.

The Philadelphia and Reading Coal and Iron Company, and the Lehigh Coal and Navigation Company have extensive water supply systems covering the territory in which they operate. The last named firm is now using clean water for cleaning its coal from a large storage reservoir which is being built by its subsidiary, the Panther Valley Water Company on Still Creek, Schuylkill County, with a capacity of two billion 500 million gallons.

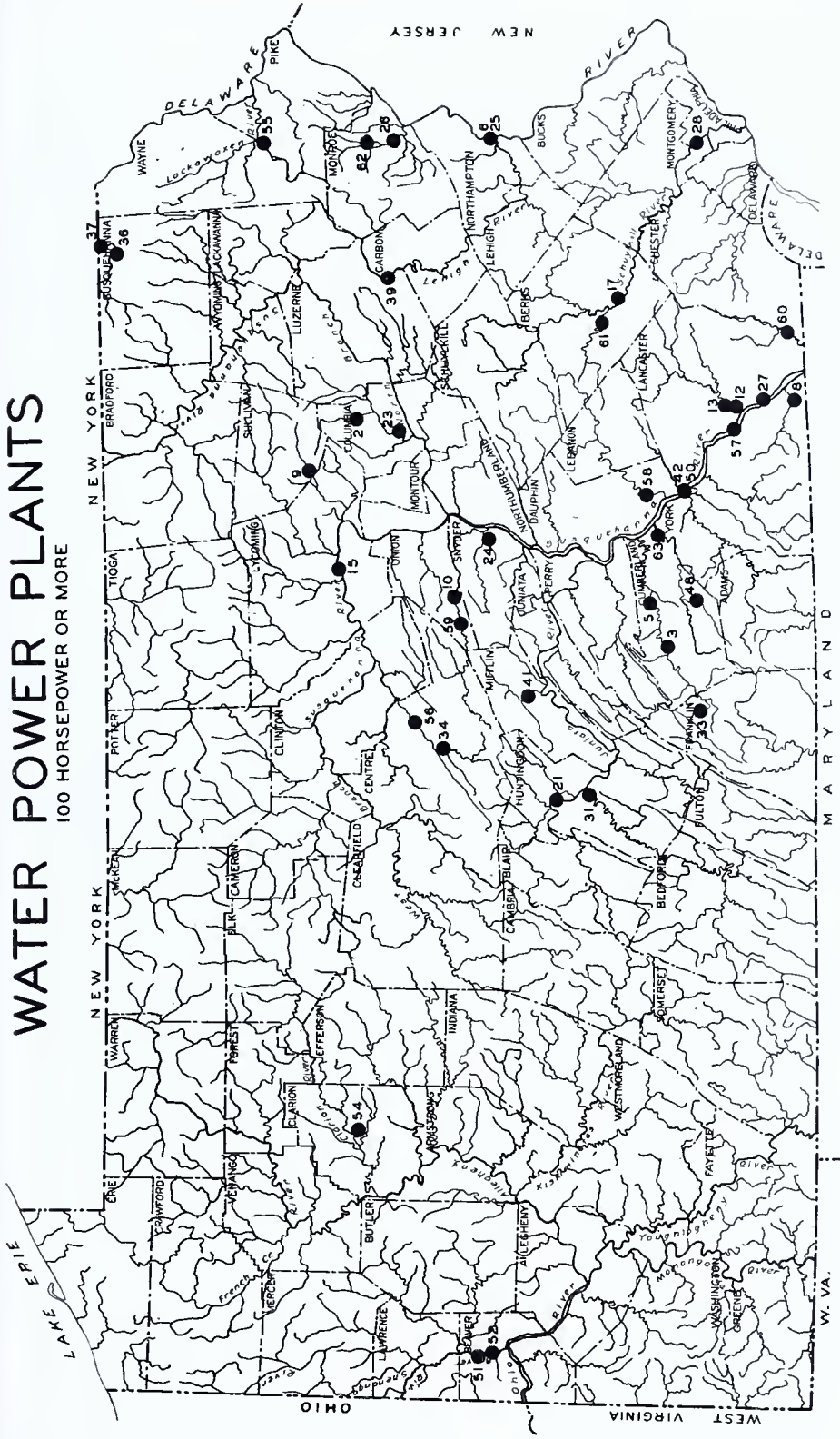
Railroads are also large users of water. The Pennsylvania railroad supplies its main line principally through controlled incorporated water companies. Included in this system, mainly in the western and central parts of the State, are 17 reservoirs with a combined storage capacity of two billion, 600 million gallons. Cement mills, glass plants, tanneries, paper mills and dye works likewise use considerable quantities of water, and a large number have their own supply systems.

WATER POWER

Present Conditions

In the early days of Pennsylvania and almost down to the present time, "Water Power" meant mechanical power generated by water. Now when we speak of Water Power we usually mean hydroelectric power or electric power generated by water. The first power plants, although small, were well suited to furnish power to small local industries. Power could not be transmitted any great distance and these industries were built up around the sites of the power developments. Many of the smaller plants have outlived their usefulness and have since been abandoned.

WATER POWER PLANTS 100 HORSEPOWER OR MORE



SPB

FIGURE NO. 55



The flow of water in most Pennsylvania streams fluctuates greatly and there are but very few places where reservoirs large enough to equalize the seasonal flows can be built economically. Auxiliary plants, usually steam, are accordingly necessary to supply power during periods of low water. When hydro-electric plants were first built they were generally considered as being in competition with steam plants; but it was soon discovered, in view of the wide variations in stream flows and the few opportunities for large storage, that hydro-electric and steam plants (in Pennsylvania at least) were not competitors; but on the contrary, supplemented each other.

State Policy

Prior to 1914 or 1915, the State had no definite policy in regard to the development of water power, but in 1923 the Legislature passed two acts establishing the present policy. The first act provides for issuing permits for power dams. Permits issued for projects not within the jurisdiction of the Federal government are limited to periods not exceeding 50 years, and provide for renewal until the projects are recaptured or purchased by the State. Permits granted for projects within the jurisdiction of the Nation provide that the permittees must secure licenses from the Federal Power Commission, and also provide that upon the waiver of any rights included in the Federal license, including any rights of recapture, that these rights may be exercised by the State. Every limited permit is subject to an annual charge.

The second act gives to public service companies holding limited permits for public service projects the right to condemn and appropriate any lands, waters and other property and rights which the Water and Power Resources Board finds necessary for the construction and operation of these projects.

Prior to 1905, and before the creation of the Water Supply Commission, 73 water power companies had been incorporated, and from 1905 to 1914, 52 others. It has been held that the act under which water and water power companies are incorporated restricts the territory for which a company may be incorporated to a single municipal sub-division - a city, borough or township, or a part thereof. When a large water power project is contemplated, companies are incorporated for each of the townships in which portions of the project lie, these companies later being merged into one company. The company is required to complete its works within a period of seven years, which period may be extended under certain conditions.

Water Supply for Steam Plants

Modern steam electric plants require large amounts of water for condensing purposes in addition to the water used for boiler feed supply. For proper condensing, water in the amount of three to four cubic feet per second is required for each 1,000 kilowatts of power generated. This is equivalent to a flow of about 2,500,000 gallons per day, or about 100,000,000 gallons per day would be required for a plant of 40,000 kilowatts capacity. As very few streams in Pennsylvania can furnish such a-

mounts of water during periods of low flow without large and expensive reservoirs, the general practice has been to build large steam plants on main rivers where there is always an abundant supply of water.

The Giant Power Survey

The 1923 Legislature created a Giant Power Survey Board for the purpose of securing facts and recommending a policy that would secure for industries, railroads, farms and homes of the Commonwealth an abundant and cheap supply of electric power. Realizing the State's water resources can supply only a decreasing proportion of the increasing power demands, the Board declared that the policy of Pennsylvania should be one concerned chiefly with electric power produced by steam from the rich bituminous coal deposits from the western part of the State.

The Board gave five essentials necessary for a wide development of steam electric power:

1. Adequate public agencies obligated to a scrupulous regard for investors' rights to attract capital and to guide it towards the social ends easily within reach.
2. Mass production, which means abundant and cheap production at sources of raw material.
3. Mass transportation to all parts of the State by an integrated system of transmission lines.
4. Effective, simple and stimulating regulation to pass on to the power consumer the abundance and cheapness.
5. Fair and justly regulated interchange of power with

other States to increase abundance and cheapness.

Legislation was recommended establishing a permanent Giant Power Board; enlarging powers of the Public Service Commission; authorizing incorporation of giant power generating and giant power transmission companies; and providing for the negotiation of interstate compacts for the regulation of interstate transmission of the power.

Nineteen bills were introduced in the 1925 Legislature and seven in the extra session of 1925, but all failed to pass.

FLOODS AND FLOOD CONTROL

Causes of Floods

Floods are caused by heavy concentrated precipitation by prolonged and moderate winter and spring rains over large areas, cloudbursts or rains of great intensity and short duration confined to small areas, and by ice gorges. Other important factors are the shape, topography and geology of the watersheds, the direction or path followed by the storms, the moisture content of the ground, snow, channel encroachments and the temperature.

About 30 major floods have been recorded in the Delaware River in the past 150 years, 35 in the Susquehanna River and about 50 in the Ohio. Numerous floods localized on the smaller tributaries of these streams are frequently experienced and cause serious flood damage.

The June 1, 1889, flood is the greatest on record in the

Susquehanna Basin. Although the storm was concentrated over the watersheds of the Juniata and the West Branch of the Susquehanna River, the central and eastern section of the State suffered unparalleled losses. At Johnstown, Cambria County, 2142 lives were lost and a large part of the City destroyed.

The Pittsburgh Flood Commission estimated flood toll to the City of Pittsburgh alone, from 1898 to 1908, at \$12,000,000, of which \$6,500,000 was caused by three floods in 1907 and 1908. The total financial loss along the Allegheny River resulting from the 1913 flood, amounted to \$720,000. The Shenango and Beaver Valley damage from this same flood was \$2,100,000. Along the Lehigh River, the 1902 flood loss reached \$760,000. In August, 1915, in the City of Erie, 34 people were drowned and damage amounting to \$2,000,000 resulted from a flood in Mill Creek. In July, 1931, Norristown suffered a loss of \$1,000,000 as the result of floods in two small creeks traversing the borough. York lost \$260,000 in 1884 and \$4,360,000 in 1933 from floods in Codorous Creek.

Floods can be controlled by retarding or storage basins, diversion channels, stream channel improvements and by the construction of levees and embankments. The logical and proper method of control is to limit the quantity of water reaching the channel to the discharge capacity of the channel by means of retarding or storage basins. Protection generally may best be secured, not by any one single method, but by a combination of several methods applicable to each other in a limited way.

The construction of 17 storage basins and certain channel improvements has been recommended for flood protection for the City of Pittsburgh. A combination of channel improvement and levee or dike construction has been suggested along the North Branch of the Susquehanna River to protect the Wyoming Valley. A combination of retarding basin, diversion and channel improvement has been in successful operation for years at Harrisburg. At present there are two flood control projects under way in the State, one consisting of retarding basin control combined with channel improvement, the other a retarding basin flood control project alone.

Flood control by storage basin retardation has been effected by the completion of the State Pymatuning Reservoir Project in Western Pennsylvania. While the primary reason for the construction of this reservoir was to provide sufficient water during the dry season for domestic and industrial use in the Shenango and Beaver valleys, the capacity of the Pymatuning lake will be sufficient to absorb and hold back the flood flow entering it until the waters from the watershed below have passed downstream and the river receded to below flood level. Had the Pymatuning Reservoir been in operation during the 1913 flood, the flood height at Sharon would have been reduced by 23.3 per cent and the maximum rate of discharge 32.5 per cent.

A carefully determined public policy for control and supervision of the streams of the Commonwealth was adopted and put into effect when the 1933 Legislature enacted the Dam and En-

encroachment Act which made it unlawful for anyone to construct any "water obstruction" without a State permit. Stream channels with adequate areas to discharge maximum expected floods have been conserved and protected. Streams that have been encroached upon and the channels restricted so as to make them inadequate to pass floods without backwater and overflow have not been allowed to become worse, and where possible serious water obstructions have been modified or removed and the channel improved for flood discharge.

In communities subject to flood damage the State has made a number of surveys and hydraulic studies. Channel lines limiting all new construction along both sides of stream channels, and to which existing encroachments are removed from time to time, have been established in Johnstown, York, Manayunk, Sharon, New Castle, Butler, Reading, Norristown, Scranton, and Erie.

The major flood control problem in Pennsylvania, flood protection for Pittsburgh and the upper Ohio River, was studied under the direction of the Pittsburgh Flood Commission from 1908 to 1912. The Pittsburgh Flood Commission recommended construction of 17 retarding or flood storage reservoirs distributed over the drainage areas of the Allegheny and Monongahela Rivers and supplemented by a river wall at Pittsburgh. The cost was estimated to be about one-half the direct loss that would otherwise be caused by flood damage to the city within a 20-year period. Between 1924 and 1929, U. S. Army engineers studied the problem and developed much additional valuable data. In 1933

the Commission submitted a new plan based upon all the essential data developed to date providing for the construction of ten storage reservoirs, seven in the Allegheny watershed and three in the Monongahela watershed, at an estimated cost of \$57,500,000.

Legislation approved in 1931 authorized the Water and Power Resources Board to study and develop a plan of flood control. Under the Act, the Board is empowered to proceed on its own initiative, or at the request of some outside person or agency, to improve stream channels, build levees and diversion channels and to construct retarding storage basins for flood control. The Board and its agencies are further empowered to "enter upon, take, appropriate or injure any land or lands", and any damages sustained thereby are to be paid by the Department of Forests and Waters.

The question of culm and flood control in the Schuylkill, Lehigh and Susquehanna rivers and their tributaries have been investigated and studied from time to time for many years, but very little has been accomplished toward bettering conditions. The anthracite coal industry is the basic industry of the region. The pollution of streams by coal colliery wastes has been in the past a necessary evil of the industry.

While collieries are recovering a larger percentage of the finer sizes of coal, nevertheless a great quantity of culm is still being wasted in the streams. To successfully solve this problem the cooperation of the coal operators must be secured and present methods of preventing pollution improved and put in

more general use, or new methods devised to combat a condition that is becoming more serious each year.

STATE ADMINISTRATION OF WATER RESOURCES

Pennsylvania was one of the first states in the Union to enact legislation leading to the development of a definite system of planning with respect to its water resources.

In 1905 the Water Supply Commission of Pennsylvania was created and organized as an administrative State agency charged with the responsibility of planning not only for the immediate but for the future use, conservation and development of the water resources of the State, except in matters pertaining to the purity or quality of water, which was a function previously placed by the Legislature under the jurisdiction of the Department of Health. It continued to function until 1923 when it was merged with the Department of Forestry to form the Department of Forests and Waters, and a new Board was created within the Department known as the Water and Power Resources Board.

The personnel consists of the Secretary of Forests and Waters as Chairman, the Secretary of Health, the Commissioner of Fisheries, a member of the Public Service Commission and an engineer member, both appointed by the Governor. Its duties consist principally in acting upon applications for charters of water power companies, mergers and applications for permits for the construction of dams and other water obstructions, etc. The Board has power, upon application of the Secretary of Forests

and Waters, to hold hearings upon and decide any other matter or thing relating to waters which may be within the jurisdiction of the Department.

A primary consideration in the creation of the Water Supply Commission came about as the result of a practice which had developed rapidly, prior to 1905, of incorporating water companies for the purpose of securing control of streams, either for purely speculative purposes or for industrial supplies to railroad companies, coal companies, steel mills or other large commercial consumers of water. These companies secured some of the best streams in the Commonwealth. Many were created solely for the purpose of speculation, and the water supply rights thus held in the more desirable streams were subsequently sold to municipalities or other water companies. The Act of May 4, 1905, corrected many of these abuses by giving the Commission power over allocation of streams and the right to decide whether the streams will be fully developed by means of storage in the interest of the conservation of water. This power is now exercised by the Water and Power Resources Board.

The Board, however, has not been given authority over the use and diversion of streams by water companies created prior to 1907. As the ownership of the water flowing in the streams rests in the Commonwealth, it would appear reasonable that the State should determine how the water should be used and to whom it should be allocated.

The authority of the Board in respect to supervision over

the development of water power is conferred by two laws; one providing for the issuance of limited power and limited water supply permits for a term not to exceed fifty years, and the other providing a method by which holders of such permits may condemn and appropriate lands, waters and other property. Provision is also made for extension and renewal of the permits and for recapture or purchase by the Commonwealth.

Realizing the necessity for foresight in dealing with the water resources of the Commonwealth, Governor Tener in 1913 made certain recommendations to the Legislature in consequence of which the body passed "The Inventory Act" which directed the Water Supply Commission to make a complete inventory of all the water resources of the Commonwealth. However, the appropriation made available was insufficient to complete the work as outlined in the Act, and the Commission was only able to compile information with respect to the present condition and utilization of the water resources as a groundwork for future studies. The report was published in 1921 and is divided into ten parts.

Part 1 contains introductory matter of general applicability to various topics, with the Commission's deductions from the information contained therein and its recommendations.

Part 2 outlines a method of improving flood conditions in the Turtle Creek Valley.

Part 3 is a Gazetteer of Streams compiled from maps and other information collected.

Part 4 contains information on all lakes and ponds whose

names could be found, while those whose areas are 20 acres and over were described in detail.

Part 5 contains a collection of all existing authentic rainfall records in Pennsylvania and a discussion of the influences effecting precipitation.

Part 6 contains descriptions of all operating water supply systems and statistics concerning the use of water for this purpose, as well as lists of chartered water companies showing their present status.

Part 7 contains descriptions of the operating hydro-electric plants as well as the larger direct utilizations of water power for manufacturing purposes.

Part 8 contains a record of floods on all the large rivers and inventories of damage done in numerous communities.

Part 9 traces the use of the water courses from early Colonial times through the canal era and includes the present extension work of the Federal government with respect to navigation.

Part 10 deals with the culm and mine drainage situation in the streams draining the Anthracite coal fields.

Following its creation, the Water Supply Commission adopted a fixed policy for the conservation, development and administration of the State's water resources, which may be summarized as follows:

- (a) Thorough knowledge of the streams of the State so that the problems of control may be known.
- (b) General plans for solving those problems.

- (c) An orderly legal code which will make practicable the execution of plans when developed and insure control and supervision over constructions affecting the river system.

It also advocated:

Topographic Surveys: Through cooperation with the United States Geological Survey the topographic map of the State should be completed.

Hydrographic Studies: Stream gaging records and studies of flood conditions should be continued and increased in scope.

Rainfall: Steps should be taken to secure a more complete knowledge of rainfall conditions.

General Plans: Sufficient information should be secured concerning each river system to enable general plans to be worked out for the control and use of the waters of that particular system. This information should include:

- (a) Character and extent of its drainage area.
- (b) Conditions of rainfall and runoff.
- (c) Extent to which the streams may be called upon in the future to furnish water supply for domestic and industrial use.
- (d) Extent to which floods menace life, destroy property and restrict growth, and the extent to which this menace and damage may be expected to increase in the future.
- (e) Possibility and feasibility of water power development, the possible extent to which the stream might become part of a navigation system.

With this information at hand, the Commission further determined that tentative general plans should be made for the control, use and development of each stream to the end that a general policy might be followed without conflict or lack of coordination.

The Water and Power Resources Board, which succeeded the Commission, now acts as a clearing house for general information on all problems of public water control. As projects are initi-

ated from time to time in various parts of the State, the Board furnishes advice as to the general methods which may be used in approaching each problem and exercises regulatory powers over all undertakings.

Water Control Code

A legal code should be outlined which, in addition to continuing and supplementing wherever necessary the present powers of the Water and Power Resources Board, will provide methods for legal cooperation and organization for constructing and maintaining water control works.

The following essentials of water control programs are found in nearly all American and European codes.

1. Improvement is not demanded by the State unless necessary to correct some abuse, but is initiated, by petition or otherwise, in the community most directly concerned.

2. A court, commission or other public authority determines whether the undertaking is of public value and whether it should be carried out.

3. If the improvement is undertaken, the territory involved is set apart by formal action of court or commission and exists so far as is necessary for carrying out the purposes of the improvement as a municipal corporation or a governmental subdivision, commonly known as a "District," and usually with its own board of officers.

4. The improvement is paid for by special assessments, each piece of property paying an amount proportional to the benefits

received. Where city or village property or interests are affected, the city or village is treated as a person or corporation owning property and dealt with just as any other property owner. In only a few exceptional cases ~~are~~ improvements of this sort paid for by flat rate taxes, and these exceptions prove the wisdom of the general rule.

CONCLUSIONS AND RECOMMENDATIONS

The State has very complete and accurate data concerning rainfall and runoff, floods and droughts. Ground water studies, however, have only recently been made and much additional information is needed, especially in the determination of the relation between ground and surface runoff.

With respect to the utilization of both ground and surface waters, very complete information is available in the report of the Inventory of Water Resources published by the Water Supply Commission as the result of information collected in 1914. Much additional subsequent data may be found in the records of the Department of Forests and Waters, the Department of Health and other State departments, boards and commissions. Further information may be obtained from reports of the U. S. Army engineers as the result of studies recently made in the Delaware, Susquehanna and Ohio basins to determine how the streams could be developed for navigation, water power, the control of floods and irrigation.

It would be highly desirable to assemble this information

and thus bring up to date the inventory of water resources, planning this work in such a way as to have available a continuing record of new developments and changing conditions from year to year. With respect to the various uses of water resources the investigation should include:

Domestic and Industrial Water Supply: A study of the water supply needs of each community or district for the next 25 or 50 years, in addition to a determination of the present needs and how they may be met.

Industrial Use of Water: The survey should develop in a general way the present and reasonable future needs of water for industrial purposes. Such survey will tend to avoid future conflict between domestic and industrial water supply developments and indicate how they may be combined to mutual advantage.

Water Power: The survey should result in a selection of possible sites for hydro-electric development and a determination as to where storage reservoirs may be built to regulate stream flow and thus increase the power which may be derived from flowing water. It should also indicate the possibilities of combining power development, water supply, flood control and river regulation.

Flood Control: Information should be collected concerning the extent to which floods menace life, destroy property and restrict growth, and the extent to which this menace may be expected to increase damage in the future.

Navigation: It is believed that the studies made by the U.S. Army engineers will cover the subject of navigation. The State's investigation should, however, determine needs of water for navigation and how the development of streams, by means of storage or for other purposes, may be correlated with navigation needs.

Storage Reservoirs: The investigation should include a study of possible reservoir sites in each drainage basin, and indicate how and for what purposes they may be developed. It is particularly desirable to secure regulation of streams near the headwaters and this may be accomplished in part by the creation of State forests areas and in part by the construction of storage reservoirs where suitable sites are available.

Allocation of Water: In order to make possible the allocation of the water resources of the State for all purposes and users, the present laws conferring limited power on the Water and Power Resources Board should be broadened to include supervision and control over the use and diversion of streams by water companies incorporated prior to 1907 or by any natural person, corporation or municipality engaged in supplying water or water power for domestic, commercial or manufacturing purposes requiring a new or additional supply of water.

Culm: A complete investigation and study should be made for the purpose of developing a sane and practical plan for the improvement of stream channels affected by culm and other wastes from anthracite mines.

WATER POWER PLANTS IN PENNSYLVANIA

100 Horse Power or More

Field No.	Stream	Name of Plant	Owner	Total installed capacity h.p.	Head
2	Fishing Creek	Benton	Pa. Power & Light Co.	150	16
3	Conodoguinet Creek	Newville	"	180	7
5	Conodoguinet Creek	Carlisle	Carlisle Gas & Water Co.	400	8
6	Lehigh River (Del. Div. Canal)	Raubeville	Pa. Power & Light Co.	2,250	30 & 15
8	Muddy Creek	Delta	Southern Pa. Power Co.	300	21
9	Rock Run	Muncy Valley	Northern Pa. Power Co.	462	502
10	Penn. Creek	Swengal	Pa. Power & Light Co.	230	7
11	Swatara Creek	Hummelstown	"	211	8
12	Conestoga Creek	Rock Hill	"	525	8
13	Conestoga Creek	Slackwater	"	924	16
15	W. Br. Susquehanna River	Williamsport	"	100	9
17	Schuylkill River	Klappertal Dam	Metropolitan Edison Co.	724	20
21	Frankstown Branch (Juniata River)	Warrior Ridge	Penn Central Light & Power	2,680	27
23	Fishing Creek	Bloomsburg	Pa. Power & Light Co.	570	29
25	Lehigh River Canal	Easton	Metropolitan Edison Co.	1,340	22
26	Brodheads Creek	Stroudsburg	"	1,250	23
27	Susquehanna River	Holtwood	Pa. Water & Power Co.	158,000	48 to 63
28	Schuylkill River (Canal)	Manayunk	Phila. Electric Co.	2,800	23
31	Raystown Br. Juniata River	Huntingdon	Penn Central Light & Power Co.	3,900	36
33	Conodoguinet Creek	Roxbury	Penn Central Light & Power Co.	800	58
34	Spring Creek	Milesburg	West Penn Power Co.	315	11
36	Susquehanna River	Susquehanna	Northern Pa. Power Co.	800	9
37	Susquehanna River	Lanesboro	"	300	6
39	Lehigh River (Canal)	White Haven	Pa. Power & Light Co.	220	22

WATER POWER PLANTS IN PENNSYLVANIA

100 Horse Power or More

Continued

Field No.	Stream	Name of Plant	Owner	Total installed capacity h.p.	Head
41	Kishacoquillas Creek	Yaegertown	Yaegertown Water Power Co.	400	16 to 20
42	Susquehanna River	York Haven	Metropolitan Edison Co.	29,213	22
48	Mountain Creek	Mount Holly Springs	Eaton Dikeman Co.	150	19
50	Susquehanna River	York Haven	York Haven Paper Co.	3,400	19.5
51	Beaver River	Eastvale Borough	Beaver Valley Water Co.	730	11
52	Beaver River	New Brighton	"	440	14
54	Clarion River	Piney	Clarion River Power Co.	34,000	75
55	Hellonpaupack Creek	Hawley	Pa. Power & Light Co.	57,000	330
56	North Bald Eagle Creek	Howard	West Penn Power Co.	100	6
57	Susquehanna River	Safe Harbor	Safe Harbor Water Power Co.	255,200	57
58	Swatara Creek	Hummelstown	Hummelstown Water Supply Co.	234	8
59	Penn Creek and Laurel Run	Laurelton	Pa. Power & Light Co.	174	8 & 24
60	Octoraro Creek	Pine Grove	Octoraro Water Co.	165	12
61	Tulpehocken Creek	West Bridgeport	Althouse Chemical Co.	225	6
62	Brodheads Creek	Minisink Hills	Analomink Paper Co.	1,200	18
63	Yellow Breeches	New Cumberland	Rivertown Consolidated Water Co.	335	8
Total Horsepower Installed				562,197	

STORAGE RESERVOIRS WITH CAPACITIES OF 100,000,000 GALLONS OR MORE.

WS = Water Supply. IWS = Industrial Water Supply. WP = Water Power.

Name of Owner	Name of Dam	Purpose	Capacity 1,000,000 gal
Adams Co. Borough of Chambersburg	Birch Run	WS	38
Bedford Co. Everts Creek Water Company	Lake Gordon	WS	1,400
Everts Creek Water Company	Thomas W. Koon	WS	2,475
Berks Co. City of Reading	Antietam	WS	101
City of Reading	Lake Ontelaunee	WS	3,880
Blair Co. Tyrone Gas & Water Company	Upper Sink Run	WS	150
Blair Gap Water Company	Kettle	IWS	188
Blair Gap Water Company	Plane Nine	IWS	110
City of Altoona	Lake Altoona	WS	800
City of Altoona	Impounding	WS	365
Tipton Water Company	Tipton Run	IWS	250
Butler Co. Butler Water Company	Thorn Run	WS	206
Butler Water Company	Lake Oneida	WS	574
Cambria Co. Summit Water Company	Wilmore	IWS	1,025
Summit Water Company	Lloydell	IWS	207
Johnstown Water Company	Salt Lick	WS	900
Manufacturers Water Company	Hickston Run	IWS	1,124
Johnstown Water Company	Mill Creek No. 2	WS	97
Johnstown Water Company	Laurel Run No. 2	WS	101
Carbon Co. Panther Valley Water Company	Hauto	IWS	1,385
Chester Co. Borough of Coatesville	Rock Run	WS	332
Philadelphia Suburban Water Co.	Pickering Creek	WS	380
Clarion Co. Clarion River Power Company	Piney	WP	11,000
Clearfield Co. City of DuBois	Anderson Creek	WS	132
Crawford Co. Commonwealth of Pennsylvania	Pymatuning	Stream Regulation	64,275
Dauphin Co. City of Harrisburg	Wildwood Park	Flood Control	200
Delaware Co. Philadelphia Suburban Water Co.	Crum Creek	WS	162
Philadelphia Suburban Water Co.	Springton	WS	3,500

STORAGE RESERVOIRS WITH CAPACITIES OF 100,000,000 GALLONS OR MORE.
(Continued)

Name of Owner	Name of Dam	Purpose	Capacity 1,000,000 gal.
Elk Co.			
Ketner Water Company	Ketner	IWS	92
Borough of Ridgway	Big Mill Creek	WS	200
Fayette Co.			
Mountain Water Supply Co.	Indian Creek	IWS	231
Citizens Water Co. of Scottdale	Green Lick	WS	166
Huntingdon Co.			
Penna. Hydro Electric Co.	Warrior Ridge	WP	515
Raystown Water Power Co.	Raystown Branch	WP	3,000
Jefferson Co.			
Kyle Water Company	Kyle	IWS	390
Clow Water Company	Clow	IWS	114
Lackawanna Co.			
Scranton-Spring Brook W. Supply Co.	Brownell	WS	847
Scranton-Spring Brook W. Supply Co.	No. 4	WS	264
Scranton-Spring Brook W. Supply Co.	Nesbit	WS	1,279
Scranton-Spring Brook W. Supply Co.	Lake Henry	WS	205
Scranton-Spring Brook W. Supply Co.	Oak Run	WS	418
Scranton-Spring Brook W. Supply Co.	Elmhurst	WS	1,200
Scranton-Spring Brook W. Supply Co.	No. 7	WS	101
Scranton-Spring Brook W. Supply Co.	Williams Bridge	WS	343
Scranton-Spring Brook W. Supply Co.	Lake Scranton	WS	2,617
Scranton-Spring Brook W. Supply Co.	Summit Lake	WS	259
Scranton-Spring Brook W. Supply Co.	Griffin	WS	543
Scranton-Spring Brook W. Supply Co.	Falling Spring	WS	258
Scranton-Spring Brook W. Supply Co.	Maple Lake	WS	214
Charles A. Sisk Estate	Lake Sheridan	WS	176
Scranton-Spring Brook W. Supply Co.	Watres	WS	1,895
Lancaster Co.			
Pennsylvania Water & Power Company	Holtwood	WP	6,975
Susquehanna Water Power Company	Conowingo, Md.	WP	93,750
Safe Harbor Water Power Corporation	Safe Harbor	WP	30,000
Lehigh Co.			
Clear Spring Water Company	Spring Creek	WS	100
Luzerne Co.			
Scranton-Spring Brook W. Supply Co.	Mill Creek Storage	WS	617
Scranton-Spring Brook W. Supply Co.	Deep Hollow	WS	252
Scranton-Spring Brook W. Supply Co.	Huntsville	WS	1,922
Hazleton Water Company	Dreck Creek	WS	192
Scranton-Spring Brook W. Supply Co.	Pike Creek	WS	2,941
Scranton-Spring Brook W. Supply Co.	Crystal Lake	WS	1,650
Diamond Water Company	Wolfs Run	WS	144
Mc Kean Co.			
City of Bradford	Gilbert Run	WS	202
City of Bradford	Marilla Creek	WS	120

STORAGE RESERVOIRS WITH CAPACITIES OF 100,000,000 GALLONS OR MORE.
(Continued)

Name of Owner	Name of Dam	Purpose	Capacity 1,000,000 gal.
Northumberland Co.			
Roaring Creek Water Company	No. 6	WS	1,330
Bear Gap Water Company	No. 2	WS	600
Pike Co.			
Pennsylvania Power & Light Co.	Wallenpaupack	WP	70,000
Schuylkill Co.			
Girard Water Company	No. 5	WS	264
Silver Creek Water Company	Silver Creek	WS	231
Silver Creek Water Company	Lower Tumbling	WS	173
Silver Creek Water Company	Mud Run	WS	203
Panther Valley Water Company	Greenwood	WS	370
Silver Creek Water Company	Upper Tumbling	WS	224
Pottsville Water Company	Wolf Creek	WS	400
Pottsville Water Company	Kaufman Run	WS	104
Pottsville Water Company	Eisenhuth	WS	300
Ashland Borough	Little Mahoney Cr.	WS	108
Girard Water Company	No. 6	WS	270
Tamaqua Borough	Upper Owl Creek	WS	311
East Penn Electric Company	Sweet Arrow	IWS	360
Pottsville Water Company	Indian Run	WS	480
Panther Valley Water Company	Still Creek	WS	2,535
Pottsville Water Company	Tar Run	WS	160
Somerset Co.			
Johnstown Water Company	Dalton Run	WS	130
Manufacturers Water Company	Quemahoning	IWS	12,000
Johnstown Water Company	Bens Creek	WS	1,100
Sullivan Co.			
Associated Gas and Electric Co.	Trout Run	WP	166
Susquehanna Co.			
Scranton-Spring Brook W. Supply Co.	Stillwater	WS	325
Samuel Entrot	Lewis Lake	IWS	240
Canawacta Water Supply Company	Comfort Pond	WS	220
Consumers Water Company	Snake Creek	WS	262
Washington Co.			
Citizens Water Co. of McDonald	W. Branch Patricks Run	WS	250
Citizens Water Co. of Washington	No. 4	WS	675
Citizens Water Co. of Washington	No. 3	WS	106
Citizens Water Co. of Washington	Speers Run	WS	125
Citizens Water Co. of Washington	Canonsburg	WS	210
Wayne Co.			
Honesdale Consolidated Water		WS	282
Westmoreland Co.			
High Ridge Water Supply Company	Tub Mill	WS	200
High Ridge Water Supply Company	Little Sugar Run	WS	124

STORAGE RESERVOIRS WITH CAPACITIES OF 100,000,000 GALLONS OR MORE.
(Continued)

Name of Owner	Name of Dam	Purpose	Capacity 1,000,000 gal.
Westmoreland Co. (con'tt.)			
Citizens Water Co. of Scottdale	Upper Bridgeport	WS	172
Westmoreland Water Company	Ethel Springs	WS	156
Westmoreland Water Company	Immel	WS	177
Westmoreland Water Company	Unity	WS	486
Jamison Coal and Coke Company.	Lower Donchue	IWS	110
Keystone Coal Company	Salem	IWS	221
Latrobe Water Company	Trout Run	WS	360
Wyoming Co.			
John M. Stark	Lake Carey	WP	1,330
York Co.			
York Water Company	Dunkard	WS	900
York Haven Water Power Company	York Haven	WP	860
Hanover Municipal Water Works		WS	185

PROPOSED DAMS AND RESERVOIRS IN PENNSYLVANIA, OR ON DELAWARE RIVER, INCLUDED IN U. S. ARMY ENGINEERS REPORT 1932
FOR COMBINED WATER SUPPLY AND POWER DEVELOPMENT OF DELAWARE RIVER AND TRIBUTARIES TO 1980.

PROJECT	LOCATION	PURPOSE	HEIGHT OF DAM	CAPACITY OF RESERVOIR IN 1,000,000 GALLONS
Cochecton	Delaware River	Power	32 feet	2.4
Narrowsburg	Delaware River	Power	60 "	4.3
Prompton	W. Branch Lackawaxen River	Storage	90 "	6.
Honesdale	Dyberry Creek	Storage	100 "	10.
Barryville	Delaware River	Power	90 "	11.
Shohola Falls	Shohola Creek	Storage	64 "	9.
Cold Springs	Shohola Creek	Power	80 "	1.6
Tocks Island	Delaware River	Power and Storage	145 "	214.
Belvidere	Delaware River	Power	68 "	13.
Chestnut Hill	Delaware River above Easton	Power	53 "	4.
Bear Creek	Lehigh River	Power	75 "	0.7
Tobyhanna	Lehigh River	Power and Storage	160 "	28.
No. 1 Mud Run	Mud Run (Tributary of Lehigh)	Conduit	175 "	9.
No. 2 Stony Creek	Stony Creek (Tributary of Lehigh)	Conduit	140 "	2.
No. 3 Bear Creek	Bear Creek (Tributary of Lehigh)	Conduit	160 "	4.

PUBLIC WATER SUPPLIES*

One of the outstanding triumphs of sanitary engineering in public health work is the dramatic reduction in typhoid fever attained by serving pure water supplies and providing communities with sewerage facilities.

As Pennsylvania became urbanized and dwelling houses in towns were built closer together, many drinking water wells became contaminated by filth from nearby privies or cesspools. With the sewerage of towns without adequate sewage treatment, streams were polluted and in the past, public water supplies were derived from them and the water served without adequate purification. Under these conditions typhoid fever, with its toll of suffering and death, stalked the State. Up to the early years of the 20th Century there was no State control over public water supplies or over municipal sewerage.

Disease epidemics so aroused the Legislature in 1905 that it created the Pennsylvania Department of Health and gave it sanitary control over water supplies and sewerage. During 1906 about 24,500 cases of typhoid and almost 4000 deaths were reported in Pennsylvania. The number of deaths per year has dropped, in the 27 years the State Health Department has been in existence, to 125 in a population of about 11,000,000 persons.

* Prepared by W. L. Stevenson, Chief Engineer, Department of Health, and Chief Engineer and Secretary, Sanitary Water Board.

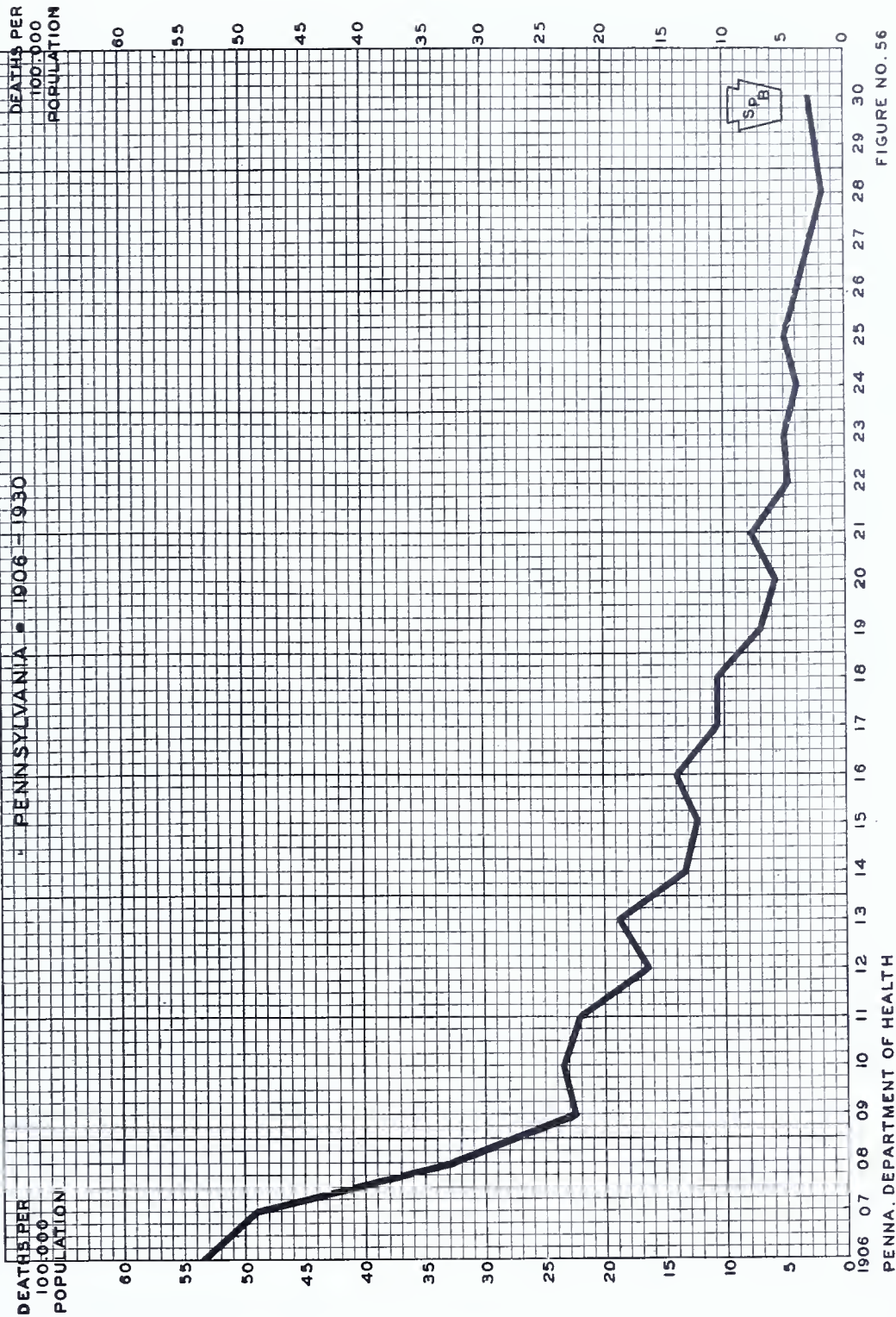
Before water can be served to the public, application must be made to the Department of Health for the issuance of a permit approving the source of supply and stipulating the conditions under which the water may be served, that is to say, as to its purification. Field examinations are made of the proposed source and the plans of the proposed water works are examined to see that the processes of purification are adequate to produce, at all times, a safe and pure water supply. Thereafter, inspections are made of the water works.

The dominant sources of public water supplies in Pennsylvania are surface streams. Water of clean streams in the sparsely settled country is impounded and in most cases chlorinated before delivery to the consumer. Water derived from the larger streams in nearly all cases is filtered and chlorinated. Seven hundred water works now serve purified water to 8,000,000 people in Pennsylvania.

Comprehensive Plans

In the past it was common for water works to be developed and extended in a haphazard fashion. The trend today is for the adoption of comprehensive water supply plans, looking reasonably far into the future. Such plans should anticipate a future superior source of supply of adequate quantity if the present source is from a river draining a substantially developed valley. They should include future water purification works and future extensions of the distributing system to meet the needs of growth in the territory to be

TYPHOID DEATH RATE



served. Comprehensive plans reasonably insure that as funds are made available and construction work done, each step is a forward one toward an ultimate goal.

Water Supply Districts.

Contiguous or neighboring communities generally can be served best and cheapest by a single water works and distributing system. This avoids duplication of source of supply, purification works and pumping stations, it centralizes technical control and also, as purified water is a manufactured product, cost is lessened by mass production. This will take care of communities in such districts that are too small to finance their own water supplies. Service of water by districts can be attained either by agreements between the municipalities involved or through the chartered area of a water company.

Artificial Purification

Years ago when public water supplies were first introduced into Pennsylvania, most streams were cleaner than at present. Under these conditions the source of supply generally chosen was the nearest available water and many of these sources are still in use, notwithstanding the increase in pollution of the raw water.

In the interim, processes of water purification have been developed to remove or modify nearly all of the different kinds of organic and inorganic impurities present in raw water. Most of these processes have been sufficiently well established

that, when operated with skill and fidelity, it is possible to produce a bacteriologically safe water and generally a palatable supply even though the raw water is too polluted to be used wisely. Obviously, however, this is repugnant.

Sources of Water Supply

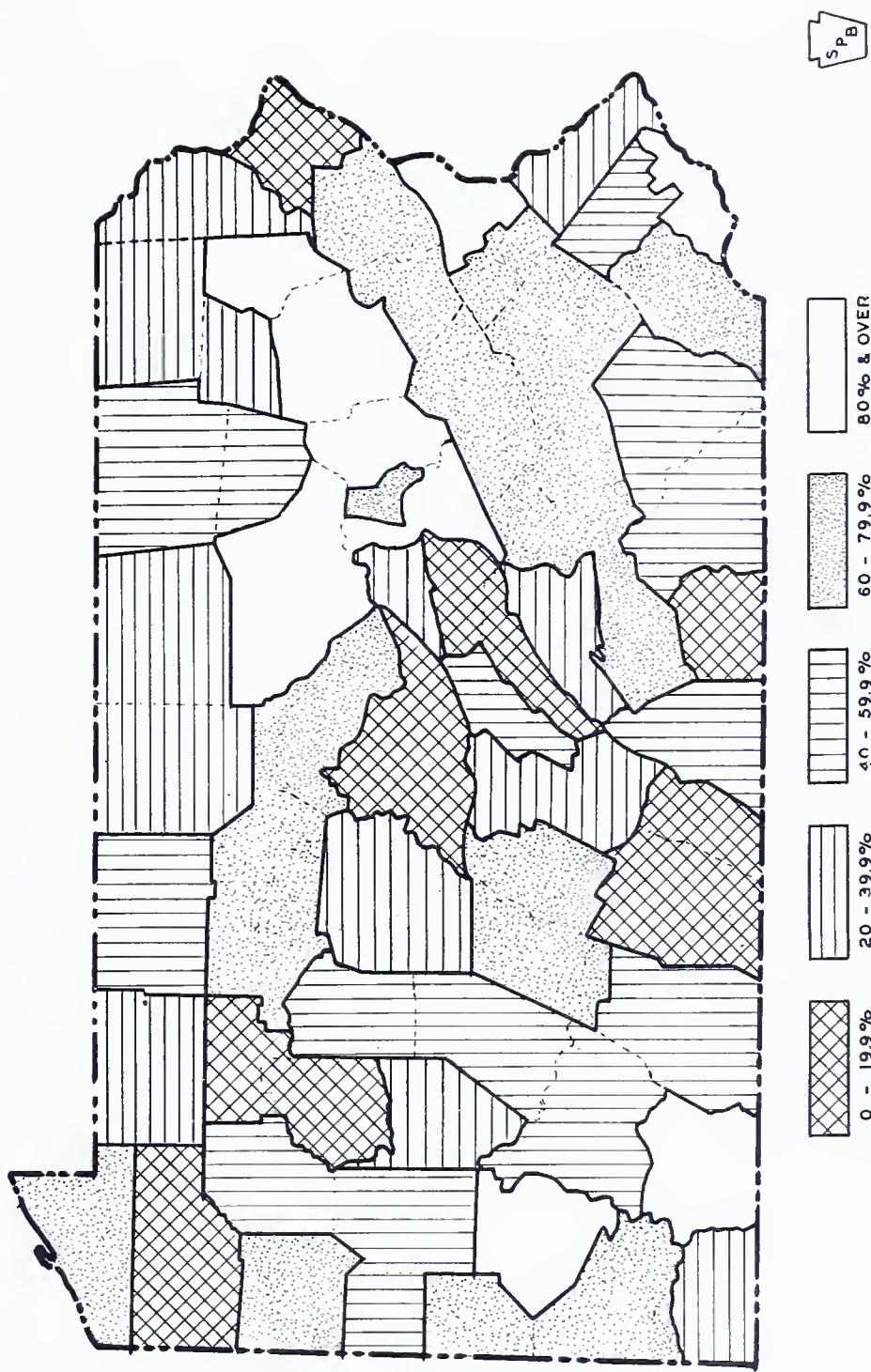
So there is a rapidly growing demand on the part of the public for the use of relatively clean water as the source of supply with minimum artificial purification rather than the serving of purified polluted raw water. This principle should be reckoned with in the preparation of comprehensive water supply plans.

The public demands and is entitled to receive a water supply not only bacteriologically safe but also one that is palatable; that is to say, free from offensive tastes, odors and color. It should be clear and sparkling, also reasonably soft and not corrosive to plumbing fixtures.

Quantity of Water

Severe droughts since 1930 forcibly showed the inadequate storage facilities of many water works whose source of supply is not a major river or lake. Minor streams during drought often shrink below the daily needs of the water works. Generally this danger can be avoided by providing impounding reservoirs wherein, during years of normal rainfall, sufficient water can be stored to adequately serve reasonable water needs through drought periods.

POPULATION USING PURIFIED WATER



PENNA. DEPARTMENT OF HEALTH

FIGURE NO. 57

Storage

Where a water supply can be safely provided by storage of relatively clean water and its chlorination (but filtration is not needed) then, (a) assured long time storage should be provided in as quiescent a state as practicable for the self-purification of the stored water; (b) recreational use of the reservoir and its margins should be prohibited to reduce danger of contamination; (c) reservoir capacity should be adequate to furnish water through drought periods; and (d) where practicable and in the public interests, reservoir capacity should also be sufficient to provide water for releases to augment the otherwise low flows of the stream below the dam.

When raw water is stored and afterwards also filtered, then; (a) if practicable, the storage should be sufficient to better the quality of the water so as to reduce the load upon the filters; (b) the reservoir should be "zoned" as to recreational use to prohibit such use in dangerous proximity to the water outlet and allow reasonable use at parts more remote from the outlet; (c) reservoir capacity should be adequate to furnish water through drought periods; and (d) where practicable and in the public interests, reservoir capacity should be sufficient to provide water for releases to augment the otherwise low flows of the stream below the dam.

Importance of good operation

All water works operators should be trained, skillful and

faithful. A study of water-borne typhoid fever outbreaks in the United States from 1920 to 1929 shows clearly the importance of vigilance in the operation of water works to prevent disease outbreaks. It can be done. Witness the typhoid record of this State.

PRIVATE WATER SUPPLIES

Approximately 2,000,000 of the State's population do not receive public water supplies but depend upon wells and springs. They are the dwellers in the rural districts and smaller towns. In the interests of public health, every community should have a pure public water supply. Lack of financial ability is the commonest deterrent to attaining this goal. There is not, and probably cannot be, State control over private water supplies because such control does not lie within the police power of the State. However, the rural typhoid rate is higher than the urban rate and its reduction is a real health problem.

To meet this need, the Department of Health, for several years has been examining, upon request, such water supplies, advising the householder concerning defects in the structures needed to safeguard the water against surface contamination and making bacteriological analyses of the water.

The rural dwellers should be encouraged to request this service and to safeguard their drinking water, provided that funds can be made available to the Department to do the investigatory work.

RELATION OF INSANITARY FACTORS TO WATERBORNE TYPHOID OUTBREAKS

UNITED STATES • 1920-1929

CONTAMINATION OF RESERVOIR		0.7%	
MISCELLANEOUS		2.9%	
UNTREATED WATER	SURFACE SOURCES	16 %	33.3%
	UNDERGROUND SOURCES	17.3%	
CONTAMINATION OF COLLECTION SYSTEM		20.1%	
INADEQUATE CONTROL OVER PURIFICATION METHODS		21.1%	
CONTAMINATION IN DISTRIBUTION SYSTEM		21.9%	



BASED UPON "THE SIGNIFICANCE OF WATERBORNE TYPHOID FEVER OUTBREAKS"
BY WOLMAN AND GORMAN, 1931.

FIGURE NO. 58

SEWERAGE

Before the middle of the 19th Century, human filth accumulated near dwelling houses in privies and cesspools, a serious menace to health. The introduction of public water supplies was a step toward ending this danger, for it led to the common use of the indoor water closet and the production of sewage, which is the once clean water supply made dirty by use in homes and factories and collected by sewers.

There was no State control over municipal sewerage or the discharge of sewage until 1905. Since then application must be made for approval of sewer plans before construction and for permission to discharge sewage into the waters of the State. The statutes provide for the issuance of permits stipulating conditions. The State has not power, nor should it have, to require a municipality to build main and branch sewers, as that is wholly a local matter. But under the statutes, the State does have power to order the interception of sewage and its treatment so as to prevent harmful stream pollution.

Sewerage Districts

As sewage normally flows in sewers by gravity, public sewer systems should be laid out, where practicable, for natural drainage areas upon which contiguous or neighboring municipalities are located.

In such a district continuous intercepting sewers are laid in the main valleys and collect the sewage of the sewered

towns along their line and convey it to suitably located sites for treatment. The economy of this is self-evident when compared with each sewered community in the district constructing and maintaining its own treatment works. District works located farther down stream, where river discharge is larger, can often use a lesser degree of treatment.

Public sewerage by natural drainage districts for contiguous or neighboring municipalities can be provided by agreements between them as authorized by State laws.

Comprehensive Plans

The preparation and adoption of comprehensive sewerage plans looking well into the reasonable future is economical of public funds. Through it, practically all new construction may become part of a complete ultimate project. Especial reference should be made to the design of the main intercepting sewers, pumping stations and sewage treatment works.

Sewage Treatment

The discharge of untreated sewage or inadequately treated sewage within prejudicial influence upon a water works intake or into insufficient diluting water, is the most dangerous kind of stream pollution. Through years of experience processes for the treatment of sewage have been developed and are in successful use whereby practically any prescribed degree of removal of impurities can be attained. The degree of treatment is determinable by the use and condition of the body of water into which the effluent is discharged. But from a practical point of view

a less degree than the ideal is sometimes the only one attainable, because of limitation of the financial ability of the municipality.

In most cases, construction of the main parts of a sewer system, its pumping stations and treatment works and the acquirement of needed land, is financed by bond issues which create municipal debt. But the Constitution limits municipal debt to 7 per cent of assessed valuation. Also, debt over 2 per cent cannot be incurred without an affirmative vote of a majority of the electors. These are serious handicaps to the abatement of sewage pollution of streams.

Sewer Rental

There is an increasing use in many States of sewer rental, which is an annual, equitable fee charged against properties connected to a public sewer. Sewer rentals can make public sewer systems and sewage treatment works self-supporting, as is the case with most water works.

All Towns Should Be Sewered

In the interest of the public health and for comfort and convenience, the built-up part of every municipality should be provided with public sewers. Where attainable, the sewage so collected should be treated to that degree needed to protect public interests in the stream below the point of discharge.

SANITARY WATER BOARD

In 1923, the Sanitary Water Board was created and empowered with the authority over sewerage and sewage disposal

formerly exercised by the Department of Health and with the authority of the Department of Fisheries and of the Water Supply Commission with regard to the prevention of stream pollution, and also empowered to study and investigate methods of preventing stream pollution.

The Pennsylvania Plan

After careful study the Board evolved fundamental policies. Having been put in practice, they became known in a number of States as the "Pennsylvania Plan", which included

(a) The classification of streams; which means the preservation of clean streams and the reduction or abatement of pollution of other streams by determining the required degree of treatment of pollution after a study of the present and probable future use and condition of the receiving stream.

(b) The scientific sanitary surveys of rivers to determine their use and condition, including the degree of pollution and the causes thereof.

(c) Cooperation, under agreements, with groups of major industries for the finding of reasonable and practicable ways and means for the treatment of industrial wastes.

(d) The making of inter-state stream agreements with departments of health of states adjoining Pennsylvania.

Sanitary Survey of Rivers

These surveys included the use of mobile laboratories for analyzing in the field samples of water of the river and of industrial wastes discharged into it, and also, the use of

stream gauges to determine river discharge. Studies are made during normal and low flows of summer which is the critical time to evaluate stream pollution.

After the data collected has been correlated and studied, they are used to make diagrams which show the amount of beneficent oxygen present in the water (a measure of good conditions) and also the oxygen demand of the water (a measure of the pollution). The difference between these is known as "oxygen balance", that is to say, the amount of beneficent oxygen which would remain in the water after the pollution load has been assimilated.

Evaluating the pollution load from municipal sewage and or organic industrial waste loads converted into equivalent human sewage, made possible a beginning of work with the major sources of pollution. Often a 70 per cent reduction of a large sewage or industrial waste load will bring about more improvement in the condition of a river than the complete elimination of a relatively large number of small pollution loads, which at a later date are taken up in the order of their importance.

One of the best features of this procedure is its equity and justice. When an approach is made to those responsible for the major pollution they can not pass on to other parties the responsibility for abatement by saying that they are not major causes of the river pollution. It works.

Industrial Waste Agreements

In 1924, an agreement was made with the leather tanners of Pennsylvania which created a technical committee provided with funds from the industry to study tannery waste treatment. Two full scale experimental plants were constructed and operated and a report submitted setting forth reasonable and practicable processes of treatment laid out in progressive steps. It was accepted by the Board and the industry and construction work has been carried on fairly well.

In 1926, an agreement was made with the pulp and paper manufacturers which also created a technical committee to study the problem of waste disposal. As a result, material improvements have been made in the condition of streams below paper mills by the installation of "save-alls" and in many cases, re-circulating systems, which have materially lightened the paper mill loads upon streams. The Board has recently undertaken an experimental study of the unsolved problem of sulphite waste disposal.

In 1928, an agreement was made with the companies operating by-product coke ovens. Formerly the waste waters discharged from these plants contained phenolic bodies which created offensive tastes and odors in public water supplies derived at points below. As a result of this agreement, means for complete elimination or substantial treatment have been installed and the trouble is practically ended. The same year, a practically similar agreement was made with

manufactured gas plants and it has had the same good results.

In 1929, an agreement was made with the bituminous coal operators. No method of treatment was then known for the acid drainage flowing from the mines. As the result of cooperative studies and of work done by the coal operators and under Federal and State relief projects, there has been brought about reduction of acid in some streams.

Inter-State Stream Conservation Agreements

In 1922, the Departments of Health of Pennsylvania and New Jersey inaugurated the first agreement of this nature in the United States. It applied to the Delaware River.

In 1924, an agreement was made between the Departments of Health of Pennsylvania, Ohio and West Virginia, relative to the Ohio River. This was subsequently extended to include the health departments of all of the eleven states in that great river basin. Under the agreement, the State Health Commissioners constitute an Executive Board and the Chief Engineers, a Board of Engineers, charged with carrying out of the technical provisions of the agreement, which are primarily the safeguarding of water supplies in one state from harmful pollution originating in another state. This agreement has brought about a cooperation between the officials of these states and its benefit has gone far beyond the original purpose.

In 1929, practically an identical agreement and set-up were made applying to the drainage basin of the Great Lakes.

Other agreements were made applying to the inter-state

streams common to Pennsylvania and Maryland and to Pennsylvania and New York and to the waters of the Pymatuning Reservoir, inter-state to Pennsylvania and Ohio.

Innumerable problems have been solved under these agreements in an amicable fashion without even consideration of litigation in the Federal Courts, which is the only means of redress where there is not such cooperation between the authorities of adjoining states.

Control of pollution of interstate streams can best be had by compacts between states but this is not easy to bring about. In the interim, agreements between State Health Departments, as referred to above, is reasonably effective.

SANITARY CONSERVATION OF WATER RESOURCES

The waters of our streams and lakes belong to the Commonwealth. Only use thereof, but not ownership, is obtainable by State permission or as a riparian right. The Supreme Court of the United States has declared that the use of water for drinking purposes is its highest use. The order of use for stock watering, for recreation, such as fishing, bathing and boating, and for manufacturing purposes, vary for different streams and in different parts of the State. Water taken from streams, used and converted into sewage and industrial wastes, must of necessity be returned whence it came; but should be treated to prevent harmful pollution.

Every practicable effort should be made to maintain all clean streams in that wholesome state and to reduce the pollu-

tion of other streams as much as possible, compatible with the general public interests and in so doing to reasonably reckon with the financial ability of our municipalities and industries.

In an urbanized and industrial state, the streams draining developed areas cannot be returned to their pristine purity. The ideal should be to attain an economic balance between the value of stream cleanliness in different places, the cost of water purification and the cost of treatment of municipal sewage and of industrial wastes.

The sanitary conservation of water resources is, therefore, a complex, scientific and economic problem of profound importance to the well being of the Commonwealth and its people.

Ground Water: Investigations of ground water and its relation to water supply have been undertaken during past years only to a very limited extent. This information is becoming increasingly important and it would appear desirable to intensify such investigations in conjunction with the surface water studies conducted by the Department of Forests and Waters.

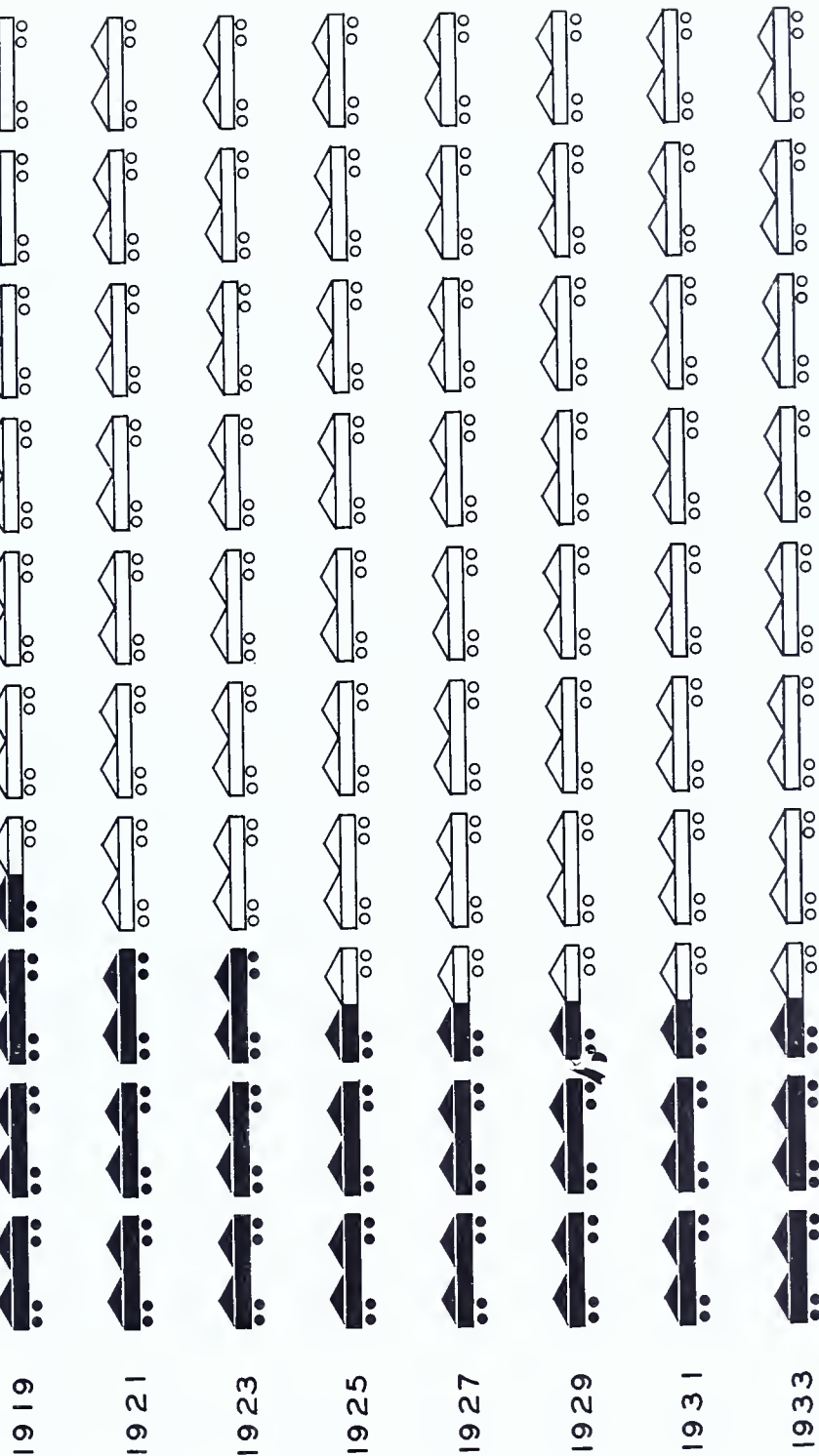
Rainfall and Runoff: With the increasing need for information governing the successful design and operation of water supply and water power plants, flood control systems and other hydraulic works, the activities of the Department of Forests and Waters with respect to stream gaging and the collection of precipitation data should be expanded by the installation of 25 automatic recording stations, principally on the smaller streams, and the addition of 40 rain gages at carefully selected locations.

MINERALS IN PENNSYLVANIA

The importance of its mineral resources, especially coal, to the well-being and future of the citizens of the Commonwealth, cannot be over-estimated. In the discussion of movements of population, the fact of the decreased production is evident in the part of the report dealing with housing. This subject, the future housing of the population, due to the stranding of whole communities in the coal fields, becomes clear. Its effect on retail trade, on banking, and on the relief problems facing the State is overwhelming.

Any planning body that may be created must of necessity consider the social problems surrounding the production and use of coal as one of its prime responsibilities.

The section on coal in this report as originally prepared, emphasized the problems of the coal operators. It is presented here, not because of this point of view, but because of the mass of the essential factual data that is herein contained. These data are of fundamental importance in the development of any State or National Plan, and of State and National policies in relation to National resources.



THE MINERAL INDUSTRIES OF PENNSYLVANIA

EACH CAR = 10% OF
UNITED STATES TOTAL
MINERAL PRODUCTION



PENNSYLVANIA'S EXTRACTIVE MINERAL INDUSTRIES^(a)

Industry	Investment 1930	Employment 1929	Value of products 1929
Bituminous Coal	\$475,000,000	130,000	\$258,607,000
Anthracite	445,000,000	153,000	385,643,000
Common Rocks	50,000,000	(c)	65,000,000 (b)
Petroleum	(c)	(c)	44,800,000 (d)
Natural Gas	171,000,000	8,600	28,189,000 (d)
Iron Ore	9,500,000	450	2,383,000

(a) Investment figures are from the 1930 report on Productive Industries, Pennsylvania Department of Internal Affairs; employe figures are from the State and other sources; value of products figures are based on United States Bureau of Mines data.

(b) Partly estimated by the author

(c) Data not available

(d) At wells

MINERAL RESOURCES

Pennsylvania's mineral industries, the very heart of her economic development, have been losing ground at a rate which indicates that sound planning is necessary if the Commonwealth is to retain its leadership.

In 1919, the value created by the principal mineral industries of the state represented $32\frac{1}{2}$ per cent of the nation's total; in 1929 it dropped to 25 per cent. The decline affects almost every one of the group so vital to the State's well-being.

Much of the readily accessible wealth has been used up and, at the same time, increasing competition has developed. Research is indispensable to combat the growing difficulties with which those industries are faced. More diligent search for new mineral deposits, development of better means of utilizing minerals, perfection of new uses, studies of underlying economic problems,--all these are necessary if Pennsylvania is to continue to profit from this essential group.

(A condensation of a survey by Raymond E. Murphy, Ph.D., Assistant Professor of Economic Geography, School of Mineral Industries, Pennsylvania State College. This important work, unfortunately out of print, was published by the Greater Pennsylvania Council. A. W. Gauger, Director of Mineral Research, Pennsylvania State College, says in a preface to Dr. Murphy's study that it furnishes the facts necessary for intelligent planning, -- a program of education and research.)

RELATION OF PA. & U.S. IN VALUE OF MINERAL INDUSTRIES

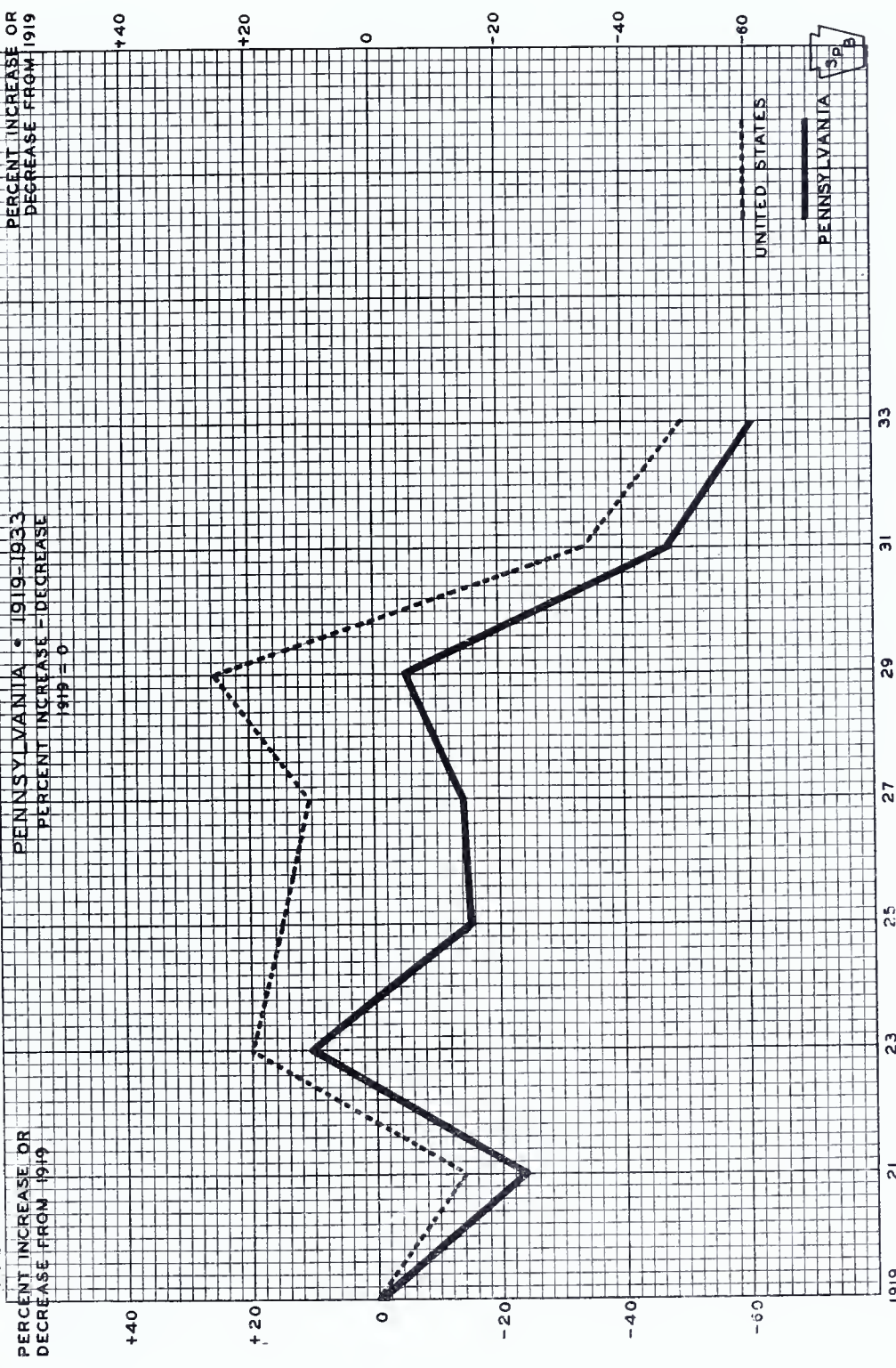


FIGURE NO. 60

R. E. MURPHY: PENNA. MINERAL INDUSTRIES

PENNSYLVANIA'S PRIMARY PROCESSING MINERAL INDUSTRIES^a

Industries	Investments 1930	Employees 1929	Payroll 1929	Total value of Products 1929	Value added by Manufacture 1929
Metallurgical Industries					
Iron and Steel				\$280,711,528	\$45,668,403
Blast Furnaces.....	\$750,000,000	8,908	\$16,000,861	1,212,876,856 ^b	503,029,271 ^b
Steel Works and Rolling Mills		159,621 ^b	287,303,600 ^b	100,900,580	37,632,690 ^b
Nonferrous Metallurgy.....	35,000,000 ^b	10,000 ^b	17,000,000		
Ceramic Industries					
Clay products, pottery and non- clay refractories.....	85,000,000	21,456	28,159,634	67,634,597	49,307,409
Cement.....	80,000,000	8,834	15,286,648	59,420,045	38,299,474
Glaze.....	68,000,000	20,095	28,153,245	81,050,092	50,907,037
Lime.....	6,806,000	1,583	1,990,049	5,990,525	4,057,333
Emery and other abrasive wheels..	1,713,000	790	1,258,126	3,924,138	2,804,557
Coal Processing					
Coke, not including gas-house coke	71,000,000	6,713	11,217,920	115,345,477	38,622,904
Manufactured gas.....	192,000,000	4,787	7,624,470	38,241,814	25,684,848
Petroleum Refining.....	222,000,000	9,495	16,608,214	243,258,869	48,215,658
Others.....	10,000,000 ^c	5,000 ^c	6,000,000 ^c	15,000,000 ^c	10,000,000 ^c

^aInvestment figures are from 1930 Report on Productive Industries, Pennsylvania Department of Internal Affairs; other data from United States Census.

^bPartly estimated by the author.

^cEstimated by the author.

The prosperity of the entire State is, in a large measure, dependent upon that of those industries. Buying power and not productive capacity is the critical factor in present day economics. Obviously, the mineral industrial worker can do no buying -- even of agricultural products -- when he cannot get work. Inadequate returns to mines, quarries and mills affect whole communities and result in population shifts and capital migrations that must be reckoned with.

Support being given to research on the part of certain associations, representing whole industries, for the benefit of the groups as a whole and not a single company, is a hopeful sign. Pennsylvania's School of Mineral Industries also has experienced gratifying support for its educational and research program.

The United States is the greatest mineral producing and processing country in the world, and, within the United States, Pennsylvania is by far the leading state in these activities. Pennsylvania's mineral industries employed about 600,000 persons in 1929, from which the conclusion may be drawn that these industries gave direct support to one-third of the State's total population.

The dominance of mining and primary processing of minerals extends far beyond the industries themselves, influencing virtually every economic activity in the State. Railways not only depend upon coal for power, but minerals constitute more than three-fourths of their freight tonnage. Products of the

GENERAL SUMMARY OF PENNSYLVANIA'S

MINERAL INDUSTRIES

1. Extractive Industries:	
Value of products, 1929.....	\$784,622,000
Number of employees, ^a 1929	
(more than).....	300,000
Investment, ^b 1930 (more than).....	\$1,150,500,000
2. Primary Processing Industries:	
Investment, ^a 1930.....	\$1,521,519,000
Number of employees, ^a 1929.....	257,000
Payroll, ^a 1929.....	436,000,000
Total value of products, ^a 1929.....	2,224,000,000
Value added by manufacture, ^c 1929.....	853,000,000
3. Summary of all Mineral Industries:	
Value created, 1929 ^c	\$1,640,000,000
Investment, 1930 (estimate).....	\$2,800,000,000
Number employees, 1929 (estimate).....	600,000

^aPartly estimated by the author.

^bFigure given does not include investment in production of petroleum, there being no data available on this point.

^cTotal value of extractive products plus value added by manufacture in primary processing industries.

steel mill, of the by-product plant or of other primary processing works, become the raw materials of many industries. Some of these make machinery for use in mining and processing minerals and hence are doubly tied to the mineral industries.

Not much less independent are certain types of manufacturing plants, like the silk mills of the anthracite regions which rely upon the excess of female labor characteristic of such areas.

Agriculture is affected because the workers in mining, mineral industries and related enterprises constitute a large non-food producing element in the State's population which must be fed. The degree to which retail trade is affected is reflected in its sensitivity to anything influencing the income of the group, such as strikes, adverse weather conditions or other factors retarding or accelerating earnings. Wholesale trade reacts almost as quickly.

Thirty-second state in land area, Pennsylvania is second in population and second in wealth, facts chiefly explained by the State's mineral resources. And of the three spots of greatest population density, two, Allegheny and Lackawanna counties, are dominated by mineral industries.

Many states owe their development to metallic minerals but Pennsylvania has gained its leading position in mineral industries because of its non-metals, particularly the mineral fuels and it is to these that chief consideration is given in that which follows:

Fundamental problems affecting the future of the State's mineral industries may be summarized.

Obtaining equitable freight rates. Discriminatory or otherwise unfair rates may impose insurmountable handicaps. Each industry should undertake as part of its research program a study of rates.

Taxation. The charge is made that some industries bear too large a tax burden. In some instances, notably in the case of anthracite, high taxes have so increased the price of the ultimate product that inroads of substitutes have been encouraged to the detriment of the industry. Taxation of minerals still in the ground has been criticized.

Overproduction. This is a serious matter in almost every one of the mineral industries. The curve of production has been rising more rapidly than the curve of demand. How to retard production to a profitable point is a major problem. The energy devoted to increasing production might better be spent in standardizing quality, developing new products and developing new uses for existing products.

Conservation. Minerals, unlike products of farm and forest, are irreplaceable. Preservation of resources for the future does not mean depriving the people living today but guarding carefully against waste and efficient utilization.

Research. The coal, metallurgical, and other industries have research organizations, but these deal chiefly with immediate practical problems and are still overshadowed by

TRENDS IN THE COAL INDUSTRY (PENNSYLVANIA)

	Anthracite		Bituminous		% Change
	1929	1919	1929	1919	
Number of mines*	303	421	1,387	2,584	- 46.3
Wage earners	142,801	147,372	121,000	154,992	- 21.9
Horse power	1,041,465	899,783	937,157	658,898	+ 42.2
Wages	\$229,967,059	\$210,289,473	\$157,730,207	\$211,346,693	- 25.4
Cost of purchased electricity	6,508,527	1,899,835	8,574,753	3,522,701	+143.4
Tons (2,000 pounds)	74,546,000	88,170,000	144,111,000	150,030,000	- 3.9
Value at mines	\$384,754,000	363,945,000	262,310,000	362,171,000	+ 27.6
Average wage	\$ 1,600	1,430	1,300	1,370	

* United States Bureau of Mines

public and semi-public bodies. Long range fundamental research is vital. Such a program is already being carried on in the Mineral Industries Experiment Station of the Pennsylvania State College. It is the only program being carried forward in Pennsylvania that unites all branches of research in the mineral industries.

Discovery. A new science of geophysical or subsurface prospecting has grown up, relying on delicate scientific instruments. The Commonwealth should take advantage of this progress and check up on its resources once more.

A certain amount of competition is stimulating, but the common result of such competition as that among the fuels is profitless operation for all. Industry and consumer alike would benefit if more co-operation could replace excessive competition.

Coal and Coal Processing.

The importance of the coal industry to Pennsylvania is difficult to overemphasize. It is the foundation of the industrial development of a great state and of far greater importance to the Commonwealth than to the nation as a whole.

Coal mining employs 290,000 persons in this state, and their dependents increase the number relying upon it for their support to between 1,000,000 and 1,500,000. Many others are employed in manufacturing, transportation and other activities closely related to the presence of coal.

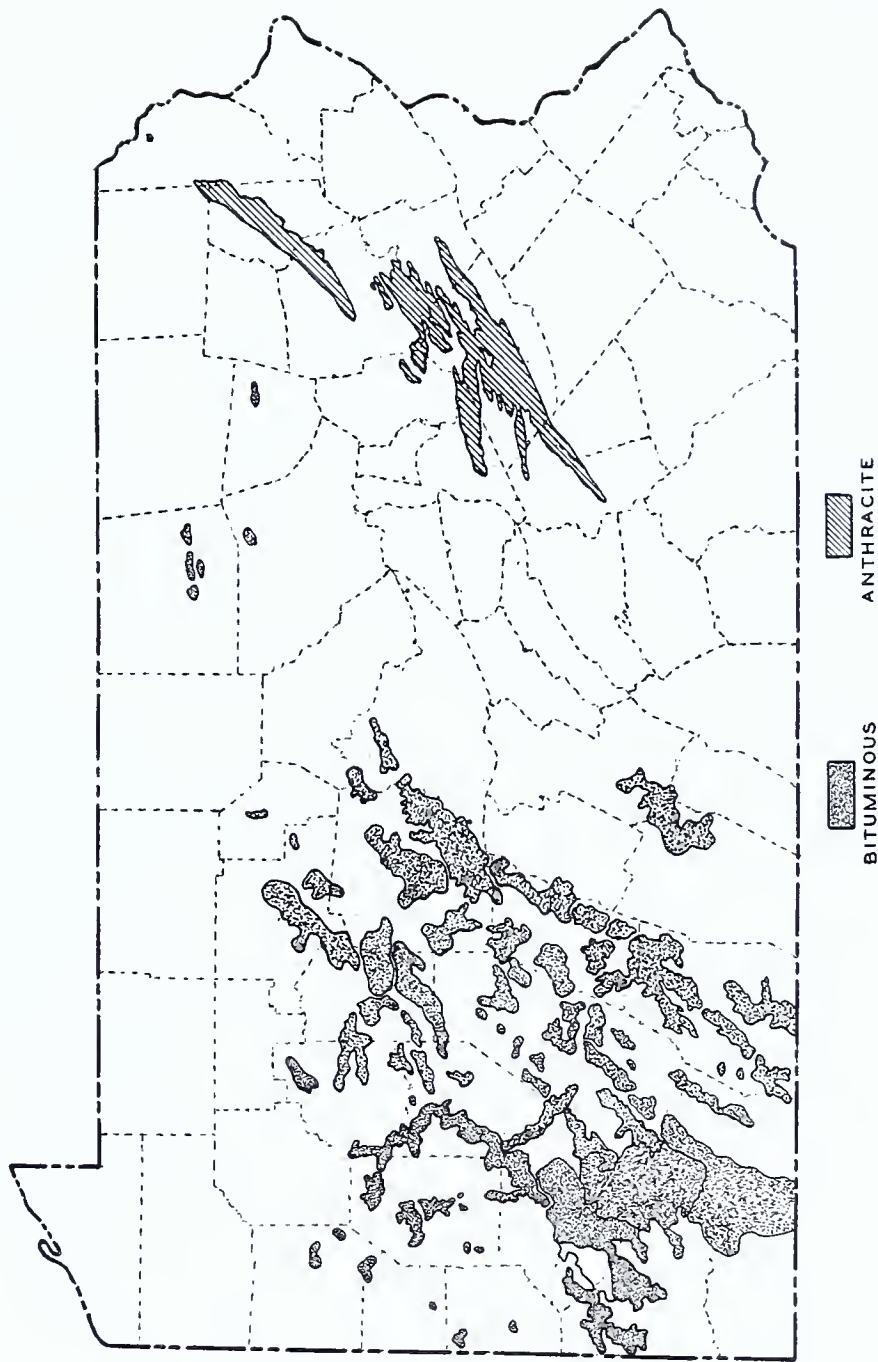
Two main classifications of coal are important in Pennsylv-

vania -- anthracite popularly known as "hard" coal and bituminous or "soft" coal. The term "rank" is used to designate the proportion of fixed carbon, volatile matter (or gases) and water which coals contain. Anthracite, almost all fixed carbon, is very high in rank, and burns without smoke.

The percentage of fixed carbon in coals decreases from east to west in Pennsylvania, the highest rank, anthracite, being found in the east-central counties. Sullivan county produces a semi-anthracite, virtually smokeless, and treated and marketed like anthracite. The low volatile bituminous coal of the central Pennsylvania fields, is also practically smokeless and competes with anthracite and semi-anthracite for the domestic market. Lower ranks, though used for domestic purposes, produce more smoke. The medium volatile coals of the Central Pennsylvania field are well adapted and chiefly used for steam purposes, while high-volatile or "gas coals" found in the western part of the state are used for generating steam including steam for locomotives, coke making, gas making and household use.

Anthracite, primarily a domestic fuel, bears little relation to the manufacturing development in which bituminous coal is so important. Anthracite reserves are distinctly limited as compared with the country's reserves of bituminous coal. While 93 per cent of the anthracite produced in the United States comes from four counties in Eastern Pennsylvania, the bituminous industry is spread over many states.

PRODUCING COAL FIELDS PENNSYLVANIA



R. E. MURPHY: PENNA. MINERAL INDUSTRIES

FIGURE NO. 61

Six and one half times as much bituminous as anthracite was produced in the United States in 1931, yet the value of the former was only about twice that of the latter. In Pennsylvania, the two are on much more even terms. The 1931 bituminous coal tonnage in the state was 1.6 times that of anthracite, but the total value of the anthracite was twice that of the State's bituminous coal output.

Nevertheless, Pennsylvania is primarily an industrial state and bituminous coal has formed the foundation of its industrial development. From that point of view, the bituminous coal industry of the State is vastly more important than the anthracite.

The anthracite industry employs approximately 140,000 men. Mining is chiefly in the hands of two groups, the "companies", ten in number, so called because of their historic connection with the railroad companies of the region, and a second group of 100 or more operators, the "independents" who lease lands they operate on a royalty basis. The "companies" own lands, produce 70 to 80 per cent of the coal and own about 90 per cent of the reserves.

The principal difficulties confronting the anthracite industry today are:

1. Competition from other fuels.
2. High production costs.
3. A heavy tax burden.
4. High costs of distribution, particularly freight,

although retailing charges are high, also.

5. Limited market for smaller sizes (a situation that is improving.)

6. The existence of too many commercial sizes of coal with consequent high costs of preparation, transportation and delivery to consumers.

7. Unfavorable attitudes of unions toward plans to increase efficiency, including the introduction of labor saving equipment.

8. Growing exhaustion of more cheaply mined deposits.

9. Increasing depth, with attending gas, roof and other troubles.

10. Increasing water.

11. Excess capacity, entailing heavy carrying charges.

12. Too high royalties on some leases, in view of present conditions.

Corrective measures have been put in practice or suggested for most of these difficulties, especially in developing better sales and service methods to meet the keen competition from other fuels. The principal invaders of the domestic market of anthracite have been fuel oil, coke, natural gas, manufactured gas, fuel briquets, imported anthracite, anthracite and semi-anthracite produced in the United States outside of Pennsylvania, hydro-electric power and bituminous coal. The use of fuel oil for the heating of houses and other structures has increased rapidly in recent years and in 1930 represented

THE STANDARD SIZES OF ANTHRACITE, THEIR USES, AND THEIR AVERAGE SELLING PRICES

(Adapted principally from Keystone Coal Buyer's Catalog for 1930 and from
Mineral Resources of the United States)

Commercial Name	Average Diameter	Principal Uses	Average sales reali- zation per short ton shipped from breakers, all regions, f.o.b. breakers, 1931	Dollars
"Domestic" sizes	Less than	Greater than		
Broken	4-3/8"	3-1/4"	Gas making, other manufacture, and steam raising.....	6.74
Egg	3-1/4"	2-7/16"	Domestic furnaces and open grates.....	7.01
Stove	2-7/16"	1-5/8"	Kitchen ranges, base burners (sometimes mixed with chestnut coal), small furnaces, open grates.....	7.37
Chestnut or Nut	1-5/8"	13/16"	Kitchen ranges, small stoves, base burners (sometimes mixed with stove coal), and small open grates; also heating service water and homes.....	7.21
Pea	13/16"	9/16"	Domestic furnaces with small openings in grate, kitchen ranges, and "banking" fires; also heating service water and homes.....	4.76
"Steam" sizes (though Buck- wheat No. 1 finds consid- erable domestic use)				
Buckwheat No. 1	9/16"	5/16"	Steam making, and self-feeding domestic furnaces; domestic stokers.....	2.79
Buckwheat No. 2 or Rice	5/16"	3/16"	Steam making; domestic stokers; anthracite gas.....	1.52
Buckwheat No. 3	3/16"	3/32"	Steam making; and chemical and industrial processes.....	1.03
Barley Boiler Finer than Buckwheat No. 3	5/16"	3/32"	Same as the last two buckwheats..... Briquets, producer-gas plants, powdered and burned either mixed with powdered bitumi- nous coal or by itself. less than for larger sizes except Boiler.	0.29

a displacement of somewhere near 3,000,000 tons of anthracite.

Coke is a serious competitor for the domestic fuel market, since in cleanliness and lack of smoke it is comparable to anthracite. Despite certain disadvantages, its use is undoubtedly growing. Small but consistent inroads on the domestic market have been shown by foreign anthracite, imported chiefly from the United Kingdom and Russia.

Producers are taking vigorous steps to rehabilitate the anthracite industry. The Anthracite Institute, representing both the larger companies and independent producers, has led in these activities. Engineers of its Anthracite Service maintain contact with dealers and consumers in thirty of the larger cities of the anthracite using territory, not only giving instruction in combustion engineering, but conducting market surveys and studying the anthracite needs of various industries.

Another important activity of the Institute is the subsidizing of research on the nature and use of anthracite. Studies of methods and equipment for using anthracite are being made in the Institute's laboratory at Primos, near Philadelphia, where automatic stoking devices and ash removal appliances are tested and equipment for more efficient and economic burning of the fuel is opening the way to disposition of more of the smaller, or "steam" sizes of coal. More and more use is being made of sizes finer than "steam" which until recently were wasted. Such material may be converted into

briquets, may be burned in powdered form, either by itself or mixed with bituminous coal, may be used in small producer-gas plants, or in other ways.

The industry's heavy tax burden operates to keep up the retail price of fuel and a detailed study of the tax problem from the point of view of present and probable future conditions is needed. Taxation of coal reserves has been the subject of criticism in both the anthracite and bituminous fields. Some of the anthracite companies own large reserves, and the present system of taxing coal in the ground imposes a heavy load upon them.

Other needs of the industry to meet its major problems include:

Better co-operation between management and labor in increasing mining efficiency and lowering costs.

Further study of the freight rate structure of the anthracite railroads. Determination whether the rates are actually too high should be possible, and, if they are, further demands for adjustment should be made.

Better control of retailing is needed to avoid excessive charges, improper representation of the product, etc.

Reduction of excess capacity may be achieved by shutting down some mines, and concentrating production and preparation in the hands of producers best equipped for efficient operation---principally with the end of avoiding the high cost of part-time mining.

Revision downward of some of the royalties which are too high for present conditions in the industry is important.

Reduction of costs by all possible methods to place the price of anthracite to the consumer more nearly on the parity with that of competing fuels is needed.

Northeastern United States and adjacent sections of Canada doubtless will continue to be the principal market area for anthracite. To the west, the industry faces a long freight haul to markets which are much nearer to the bituminous coal deposits as well as the sources of competing fuels; to the south higher temperatures, lower standards of living, and competition with bituminous coal prevent any considerable extension of markets.

The need for the anthracite industry, therefore, seems to consist of a more and more thorough development of its present market territory with an extension of the use of anthracite within that area.

Pessimistic views of the future of the anthracite fields after the coal is exhausted 100 years hence, with towns and villages now thriving becoming deserted, do not seem to be justified. The percentage of freight other than anthracite carried by the railroads of the anthracite regions is growing; these roads have developed terminal facilities making possible a growing trunk-line business; and some of them have established "new industries" departments to attract enterprises to the area.



USES OF PENNSYLVANIA ANTHRACITE

AS OF 1929

A number of manufacturing industries are established already. With a good location and excellent transportation facilities it seems probable that greater manufacturing development will keep pace with the decline of coal mining.

The bituminous coal area of Pennsylvania forms a block of fifteen counties with extensions and small isolated areas in at least thirteen others. In 1931, according to the United States Bureau of Mines, Pennsylvania produced 97,658,698 net tons of bituminous coal valued at \$155,060,000. More than 116,000 persons were employed in the industry in that year and the capital invested amounted to nearly \$500,000,000.

Overproduction is the curse of the industry and the disposal of a surplus labor supply is a serious matter. Increased use of mechanical devices permits cheaper production, but increases the productivity of the mines and displaces laborers.

While productive capacity has increased, competition from other fuels and increasing efficiency of coal utilization have curtailed demand.

A healthier industry seems certain to result from a decision of the United States Supreme Court opening the way to much needed consolidation, which previously had been held to be in violation of the Sherman Anti-Trust Law. Despite the fact many have believed some form of pooling would best overcome the present inefficient overproduction, until the Court's decision in March, 1933, in the case of Appalachian Coals, Inc., the way seemed blocked. Appalachian Coals, Inc., was

formed by 137 producers in the Southern high-volatile district of Kentucky, Tennessee and the Virginias, representing three-fourths of the tonnage of this district.

Similar agencies representing other groups of operators are being formed in Pennsylvania and elsewhere. The movement undoubtedly will bring about some control of production, and hence a beneficial stabilization of the industry. Moreover, producers of a certain rank of coal will now present a unified front in marketing their product.

Pennsylvania's greatest coal reserves lie in Greene and Washington counties, and a shift of the principal mining activity to these southwestern counties is to be expected.

Although more than 40,000,000,000 tons recoverable bituminous coal are estimated to be left in the ground in Pennsylvania, less than 10,000,000,000 tons are in thick or moderately thick beds, such as those now being mined. At the present rate of production, this will last 70 or 75 years. At the end of that time large reserves will still remain, but of coal occurring in such thin seams and so difficult to mine that the State will be unable to maintain its position as a leading producer. Since the great metallurgical and other manufacturing industries of the State depend upon cheap coal, it is obviously highly important that coal waste be eliminated.

A problem which arises occasionally even now and which is sure to arise more frequently in the future is this: As the minable coal is exhausted, what will become of the coal-

MILLIONS OF TONS

BITUMINOUS COAL PRODUCTION

MILLIONS OF TONS

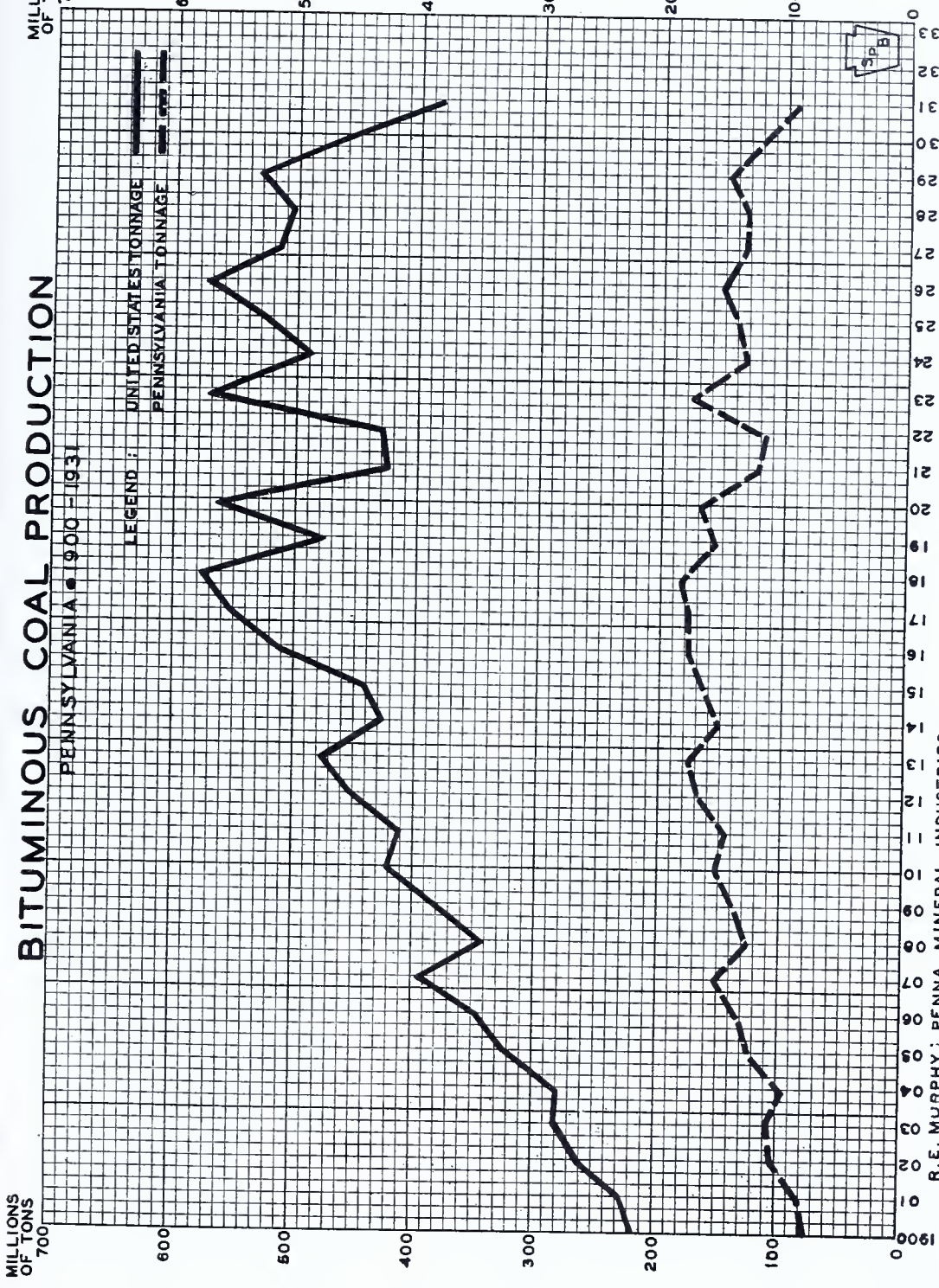
PENNSYLVANIA 1900-1931

LEGEND : UNITED STATES TONNAGE
PENNSYLVANIA TONNAGE

Sp B

R. E. MURPHY : PENNA. MINERAL INDUSTRIES

FIGURE NO. 63



mining communities? Will the present coal-mining valleys revert to wilderness? The suggestion has been made that the housing, labor supply, and other facilities might well attract new industries -- that the mining communities might thus gradually change to manufacturing towns. These communities should be carefully studied, and eventually, assisted in readjusting themselves to their changed environment.

Pennsylvania's production of bituminous coal has shown a fairly steady, though gentle decline since 1918. More is known about the supply than demand, and more about production than consumption. The producer knows his coal output. Available data suggest the iron and steel industry (including the manufacture of coke used in the industry) is the principal consumer; that the railroads are second and that household use is third. A host of other uses - electric utilities, steamship fuel, exportation, gas manufacture and certain general manufactures (stone, clay and glass products; metals and metal products other than steel; food products; chemicals and fertilizers) also account for important amounts.

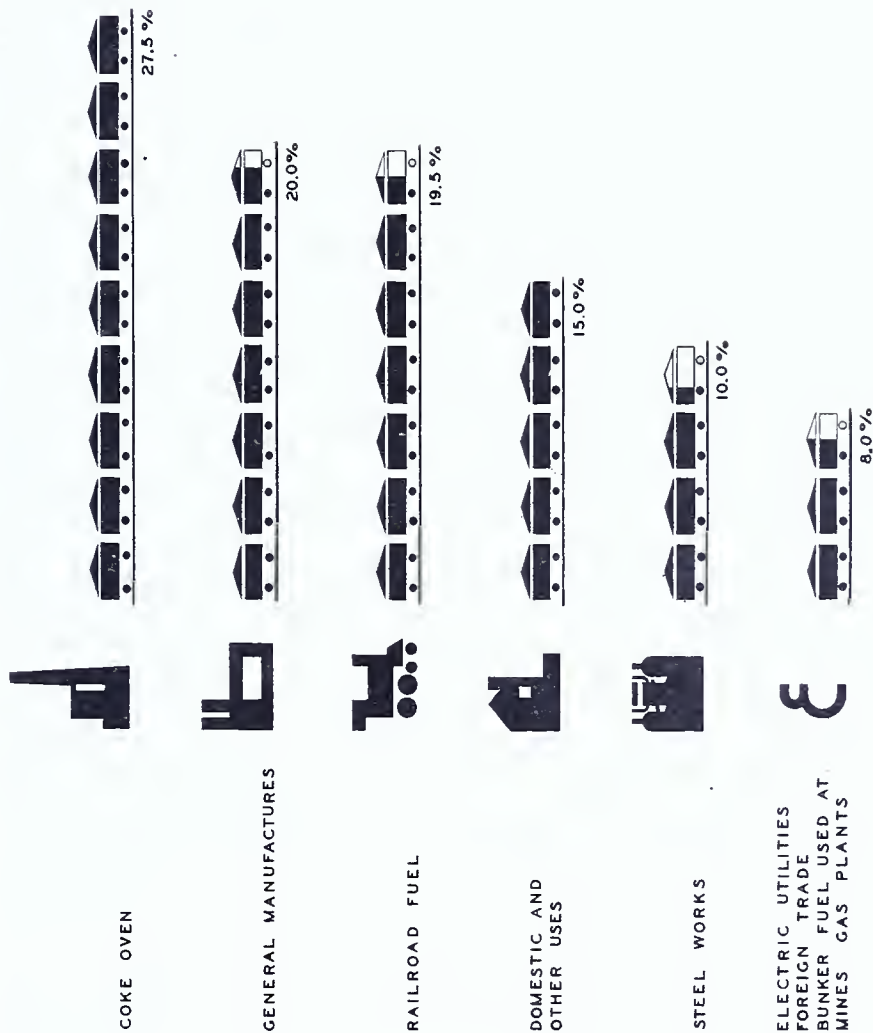
Competition from other sources of power has been an important factor in the decreased use of bituminous coal, which contributed 70 per cent of the total energy derived from mineral fuels and water power in the United States in 1909 and only 48½ per cent in 1931. Much of the relative increases of other sources of power represents, directly or indirectly, replacement of coal; but of equal importance in slowing down

the use of coal have been advances in fuel efficiency.

Domestic oil has shown the greatest gain as competitor. Water power and natural gas also have made gains, while imported oil is not to be ignored. Tariffs were imposed upon foreign coal and oils in 1932 in efforts to lessen the competition.

The seasonal character of soft coal consumption provides a serious problem for the industry for which storage seems the only cure. The producer rarely has facilities for storage, which is left to the wholesaler, the retailer and the consumer. For instance, householders are encouraged to get winter supplies in the summer months. Large quantities of lake-cargo coal are stored each summer along the Great Lakes for distribution throughout the Northwest. Many large industrial consumers, such as utilities, and nearly all wholesale and retail coal dealers have storage facilities. Storage for the slack season keeps the miner at work, insures the consumer of a supply when he needs it and spreads the burden of transportation over a longer period.

Distribution is accomplished by rail and waterways and to a lesser degree, over the highways. "The coal problem is a railroad problem" is an often heard saying that is still essentially true, although $17\frac{1}{2}$ per cent of the coal loaded for shipment in 1930 was loaded directly upon river barges or other river vessels. Use of high-pressure pipe lines for transporting pulverized coal from the mines to consuming



USES OF PENNSYLVANIA BITUMINOUS COAL

AS OF 1929

FIGURE NO. 64

centers is under consideration.

A crying need of the present is a thorough revision and simplification of freight rates so that they will be based primarily upon actual cost of service. The freight rate structure affecting bituminous coal is exceedingly complicated. Preferential rates have been given to newer and outlying fields, making the consumer of "short haul" coal bear part of the cost of transporting "long haul" coal and making the average freight rate on all coal higher than need be by favoring "long haul" coal.

Stream pollution by means of escaping mine water forms a vexatious problem in both the anthracite and bituminous coal industries. Underground water coming in contact with air and iron pyrites is rendered more or less acid and is popularly known as "sulphur water". Many miles of streams draining the bituminous coal fields have been rendered acid by this "sulphur water".

No feasible method has been found to render the polluted waters more alkaline but certain operators have found that by concentrating drainage at specified points many streams may be left unpolluted and suitable for public water supply and fish life.

In the anthracite fields pollution is caused by dumping silt and rock, the waste products of the industry, into streams. Thus fine coal is wasted and deposits so clog the channels that floods are common, sometimes causing much dam-

age. Some operators are using sludge ponds, thus avoiding stream pollution and accumulating a product which has or will have value. Others are using silt as mine fillings, with rock and boiler ashes added. In a few months the silt solidifies enough to allow robbing the solid pillars without danger of surface subsidence. The net result is a larger coal recovery and a marked reduction of waste accumulations at the surface.

Processing Methods.

Coal processing produces coke, gas, tar, coal tar dyes and many other chemicals. Coal may be heated in retorts, thereby driving off the volatile matter and leaving light, porous, smokeless fuel called coke. If this process is carried on in a special kind of device called a by-product oven, tar, gas and various other substances are obtained. Or the bituminous coal may be treated particularly for its gases, with coke as a secondary product.

Beehive ovens, devoted to the production of coke and ignoring the by-products, reigned supreme until 1918 but a growth in knowledge regarding the recovery and use of valuable by-products has led to rapid replacement of this type of oven, which is now regarded as having served its purpose and destined to pass out of existence. This fact colors the whole future of the industry in Pennsylvania, for although Fayette, Greene and Washington counties have their larger reserves, it is unlikely that these counties ever will be important coke

PRODUCTION OF COKE

PENNSYLVANIA • 1920-1931

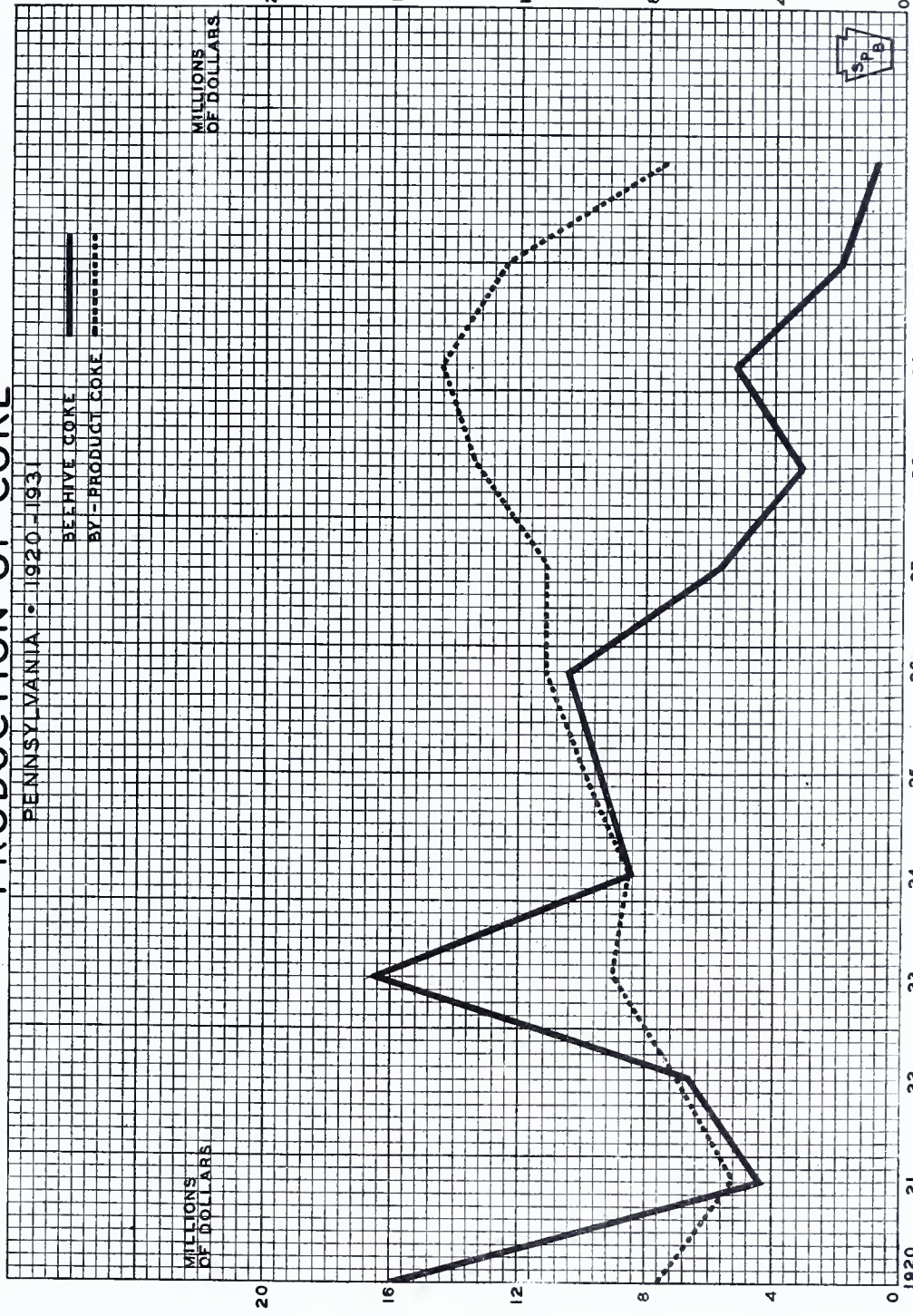
BEEHIVE COKE
BY-PRODUCT COKE

MILLIONS
OF DOLLARS

MILLIONS
OF DOLLARS

20
16
12
8
4
0

1920 21 22 23 24 25 26 27 28 29 30 31



producers. Instead their coal will be sent to by-products plants conveniently located with respect to markets.

The major interest of the coke industry is in obtaining a product strong enough to be suitable for blast furnace and foundry use. Nevertheless, a continued increase in the use of coke for household purposes is the most striking feature on the industry's horizon. Pennsylvania's principal part in the development of this trend probably will be the shipment of coal for use in by-products plants situated in New England, New York and elsewhere in the areas of maximum demand for household coke.

Related closely to the coke industry is manufactured gas, first among the uses of which must be listed "domestic purposes" --- cooking, water heating, house heating and other uses in the home. Once of great importance as an illuminant, it has been succeeded in this field by electricity.

In the field of industry gas, which has the great advantage of adaptability to accurate temperature and furnace atmosphere control, is gaining in favor rapidly.

Types used include coke-oven gas; coal gas, made by distilling bituminous coal in an air-tight retort; blue water gas, made by passing steam through a large chamber filled with glowing hot coke, or anthracite; carburetted water gas, which is blue water gas enriched with gasified oil; producer gas, generated by blowing a mixture of air and steam up through a thick hot bed of coal or coke; blast-furnace gas, a by-product

of the smelting of iron ore, and mainly used to supply power at the smelter; and oil gas, made by the thermal decomposition or "cracking" of hydro-carbon oils into lighter, fixed hydro-carbon gases.

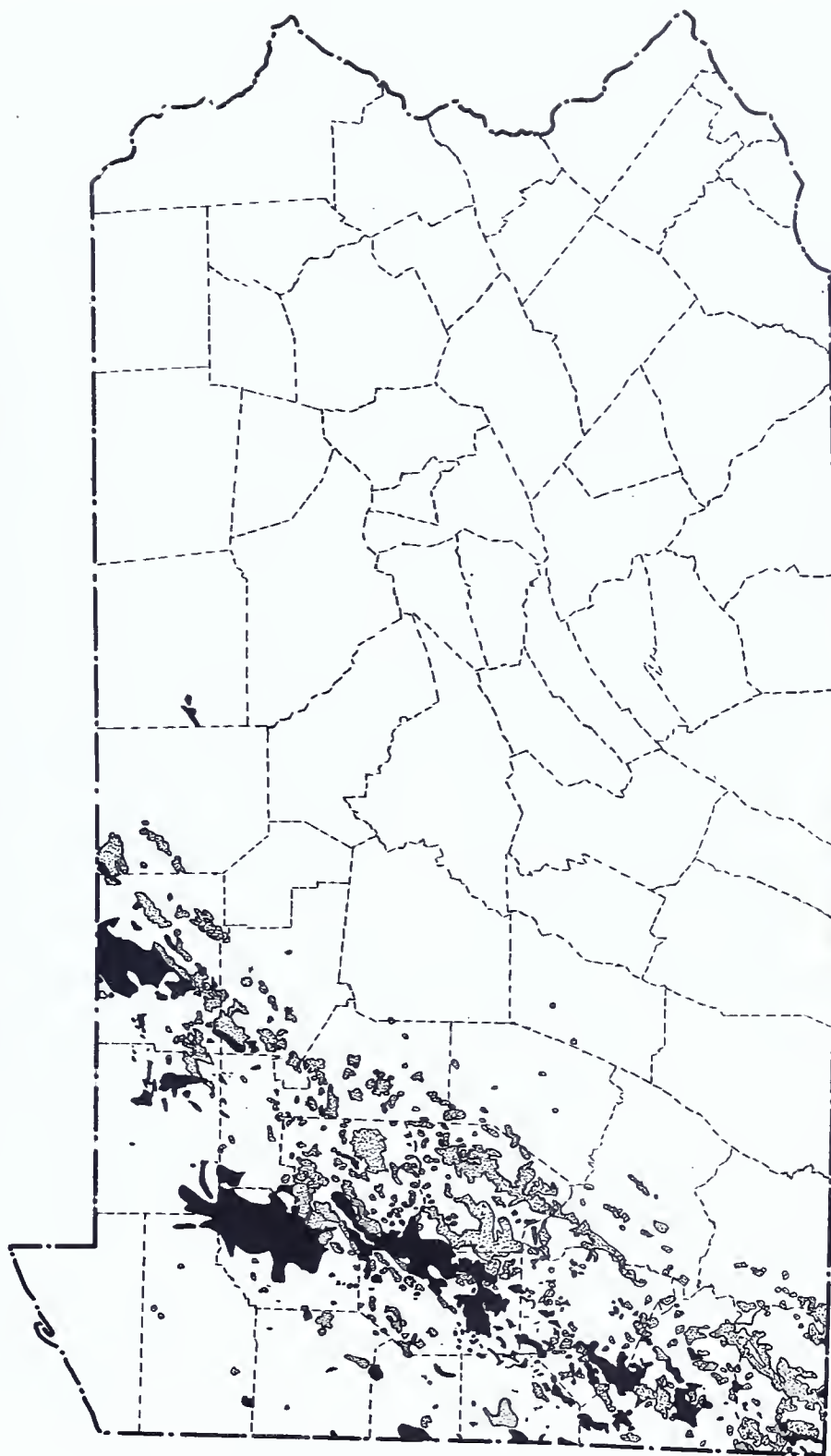
The average manufactured gas delivered to consumers in the eastern United States is a mixture of coal gas and water gas, and of by-product coke oven gas where it is available. The production and consumption of manufactured gas has been increasing steadily and is expected to continue to do so, since appreciation of it as a fuel is growing.

Petroleum and Natural Gas

As an extractive mineral industry, petroleum is exceeded in Pennsylvania only by the anthracite and bituminous coal industries in the value of the products. All three of its branches, production, transportation and refining, are represented in this state, which produced 11,892,000 barrels of crude petroleum in 1931 with an estimated value, at the wells of \$23,550,000. Pennsylvania ranked eighth in bulk of production, with 1.4 per cent of the United States total. The high grade of lubricants made from Pennsylvania petroleum and the nearness to markets accounts for the State's higher rank in terms of value than in volume.

Pennsylvania crude oil not only makes the highest quality lubricant, but also has a lubricating oil content of approximately 23 per cent as compared with a 3 per cent average for the United States.

NATURAL GAS AND OIL FIELDS



 OIL
 NATURAL GAS

SPB

BASED ON DATA FROM U. S. GEOLOGICAL SURVEY

FIGURE NO. 66

Pipe lines form an important part of the petroleum industry, and although transportation cannot be definitely evaluated, it is an integral part of the State's petroleum industry, linking as it does, production and refining.

The value added by manufacture for Pennsylvania's petroleum refining industry in 1929, was \$48,215,658, nine per cent of the United States total. In petroleum refining, Pennsylvania with a rank fourth among the states, is of greater relative importance than in crude oil production. This is accounted for by the importation of crude oil by southeastern and western Pennsylvania refineries.

Petroleum production employs a large number of persons in Pennsylvania --more than 4,000 in McKean County alone, although exact data on this point is not available. About 9,500 persons were employed in the petroleum refining industry of the state in 1929, according to the United States census.

The State has played an important part in the industry. The first oil well drilled in the United States was that of Colonel E. L. Drake, near Titusville, which was completed August 28, 1859. This produced about 25 barrels a day, the oil commanding about \$16.00 a barrel. Methods and tools developed in the early Pennsylvania fields are in use wherever the industry has spread. Men trained in Pennsylvania have drilled many of the wells in other fields.

Improved Methods for Secondary Recovery

Pennsylvania's petroleum is a premium product from which

lubricants of the highest grade are made. It must be conserved and recovered with maximum efficiency, since without lubrication the wheels of industry would stop turning.

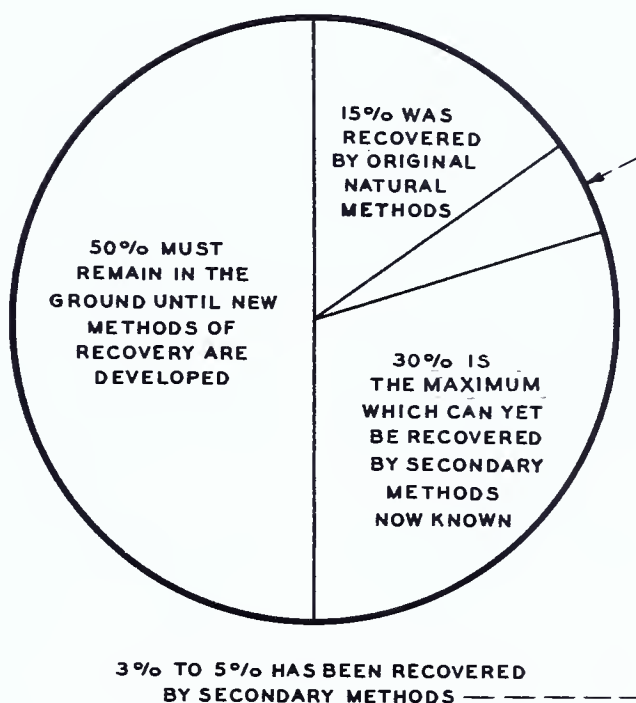
The days of flush production are gone and the genius of man is challenged in order to insure a more complete recovery of our reserve. It has been estimated that only 15 per cent of the original petroleum is recovered by natural flooding methods. In the Bradford District of Pennsylvania a flooding method has been devised which increases the ultimate yield by an additional 15 to 20 per cent. Even by this method, however, 50 to 60 per cent of the original oil still remains in the ground and may be lost forever unless new methods of recovery are devised. The effect of this may be realized when one considers that the Bradford District is only 5 per cent of the Pennsylvania petroleum area and yet is responsible for 85 per cent of the State's production. It is estimated that the Bradford area will be worked out in 20 years by the existing methods of production. At this time we do not know how to recover the remaining 4,500,000,000 barrels of petroleum still in Pennsylvania sandstones. This is a challenge to our initiative and genius.

Overproduction

Overproduction, fostered by unrestricted competition, is of world-wide scope and of course finds its echoes in Pennsylvania. The demand for "Pennsylvania grade" crude has been kept up, in part through advertising, but low prices and the nec-

THE RECOVERY OF PETROLEUM

PENNSYLVANIA • 1930



essity for proration have affected the Pennsylvania fields. Proration was lifted in the fall of 1931, with the understanding that producers would maintain a balance between production and consumption. In 1932, however, the Eureka Pipe Line Company out runs 10 per cent, indicating a resumption of a certain amount of proration.

A tariff on "cheap foreign oil" has been demanded by the producers in Pennsylvania and other states, who blame many of the recent troubles of the industry upon such imports.

Under present conditions and methods of production, it is thought that an average annual production of 10,000,000 to 12,000,000 barrels may be maintained for 50 or 60 years. If demand increases and prices rise, this production may be greatly increased by water-flooding methods. But such speeding of production would shorten the life of the industry in Pennsylvania.

Petroleum is the sole commercial source of gasoline, which has made possible the spectacular development of the motor-driven vehicle, and gasoline accounted for 43.8 per cent of the value of products from Pennsylvania's refineries in 1929, being valued at \$106,371,694. Lubricating oils came next, with 29.1 per cent or \$70,776,547. Fuel oils accounted for 12 per cent or \$29,352,168. Other products included kerosene, naptha, benzine and tops; greases; and a variety of minor products.

With the constant plague of over-production hampering the petroleum industry, we are likely to lose sight of the fact

that the petroleum supply of the world is being used up at a very rapid rate. Advancement of the cracking process will increase more and more the gasoline production from a given amount of crude. But this and other methods will simply defer the inevitable.

Ultimately, motor fuel must be obtained from other sources than petroleum, or at least other sources must supplement the supply. As petroleum production declines, prices will rise until oil-shale treating plants can work at a profit. Bituminous coal and lignite, through low-temperature carbonization or liquefaction, may become sources of substitutes for petroleum products. Natural gasoline, of which 16,713,000 gallons were recovered from natural gas in 1930, is too volatile for a motor fuel unless blended. By-product coking produces light distillates, such as benzol, usable as a substitute for gasoline, and the heavier distillate, or tar, as a substitute for fuel oil.

Finally, several agricultural products (such as alcohol and vegetable oils) have been employed or proposed as substitutes for gasoline in the operation of motors. Thus, though prices for motor fuel and other petroleum products may rise, it seems probable that new technology and substitution will solve the problem of the future.

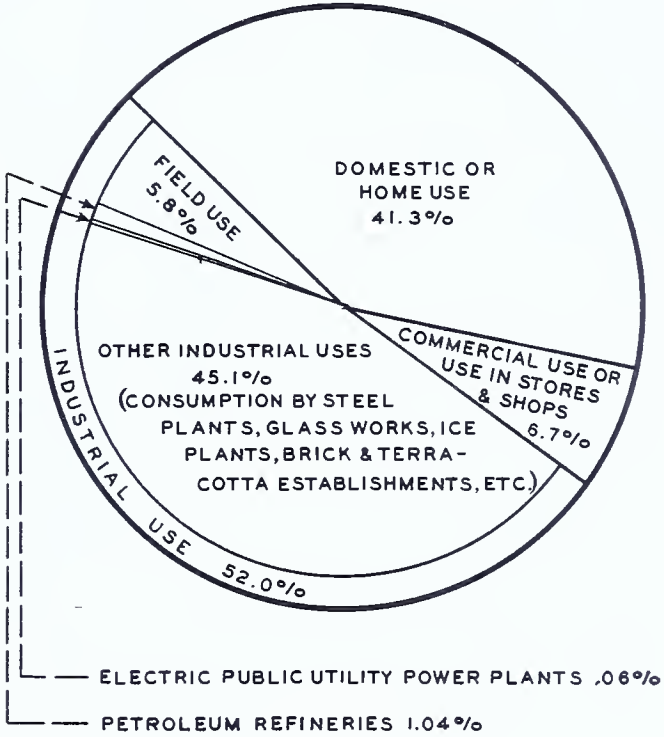
Natural Gas

The natural gas industry was an offshot of the petroleum industry. Until 1883, the gas was considered a nuisance and

USES OF NATURAL GAS

PENNSYLVANIA

TOTAL CONSUMPTION
108,218,000,000 CUBIC FEET



NATURAL GAS OUTPUT

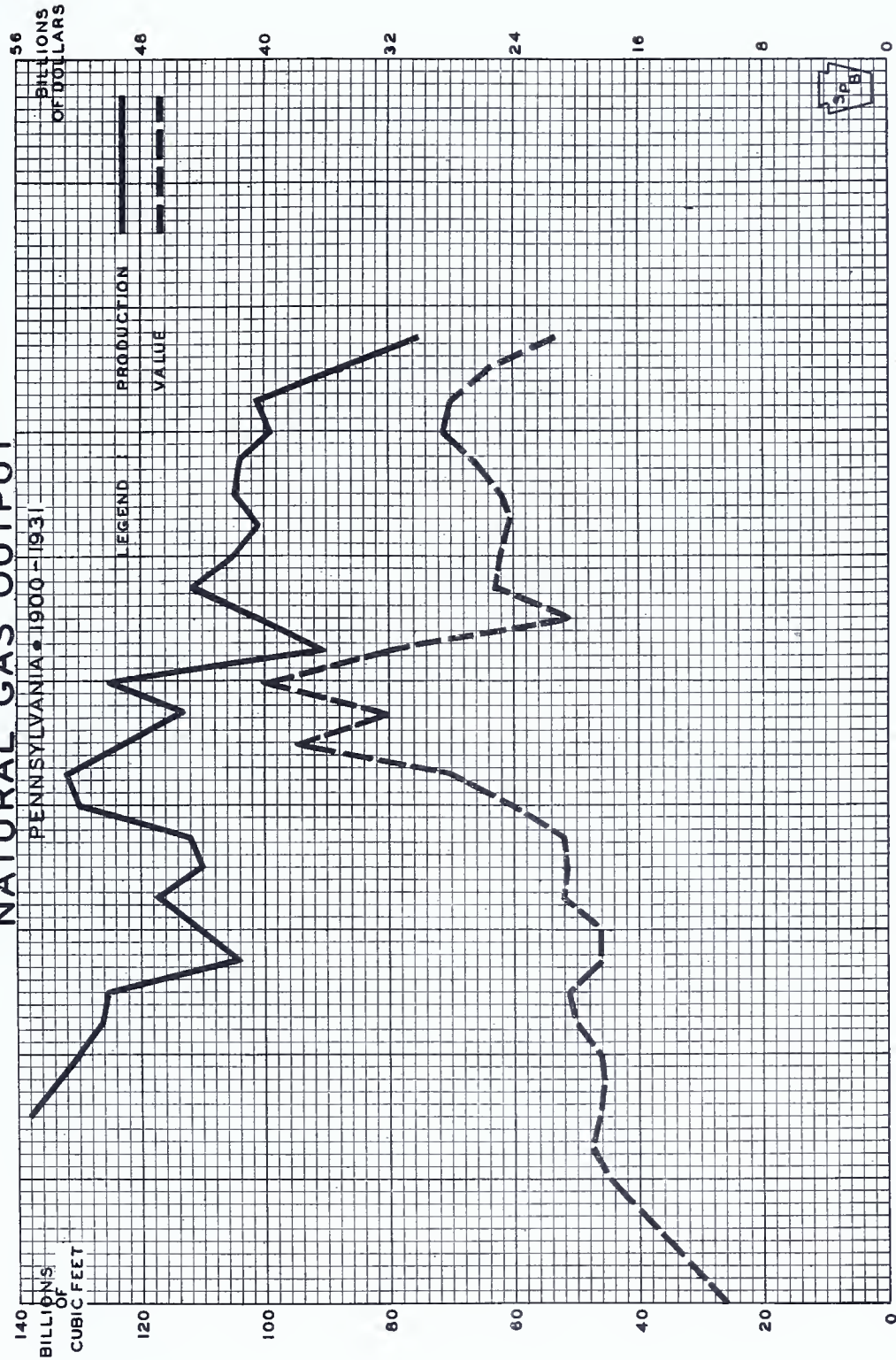


FIGURE NO. 69

R. E. MURPHY: PENNA. MINERAL INDUSTRIES
10 x 10 to the Inch

few attempts were made to utilize it. In that year, it was piped to Pittsburgh for use in industries. For 25 years, many of the steel mills, iron foundries and glass factories relied solely upon natural gas for fuel. Then supplies began to fail, partly because of waste and partly because of normal exhaustion.

Despite temporary spurts in production due to new fields, a steady decrease accompanied by a steadily growing appreciation of the value of natural gas has been observed in Pennsylvania in the last few years. In 1931, the State produced 74,797,000,000 cubic feet of natural gas with an estimated value at the wells of \$21,092,754, just a little less than the value of petroleum produced in the State in the same year. The gas came from approximately 20,000 producing wells.

Two areas of particularly large production stand out. One includes Armstrong, Clarion, and Jefferson Counties; the other, Greene and Washington counties. A third region, the Tioga county field, although not comparable to the other two in present production, is of especial interest because of its newness and possible future importance. In the first quarter of 1932 production had risen to 500,000,000 cubic feet daily. A pipe line has been completed to Williamsport and another to Syracuse, New York. Possibility of sending the gas to New York City and New England is under consideration.

Predictions regarding the future of the industry are difficult to make. New drilling is going on. Deeper drilling, the

Mining and Quarrying (Other than Coal) 1929

	Number of En- terprises	Wage Earners	Horse Power	Volume of Production
Limestone	201	6,048	103,188	19,124,040
Sand and Gravel	46	1,208	43,717	11,002,656
Iron Ore	4	680	16,448	4,515,586
Slate	33	1,951	15,334	4,330,001
Basalt	20	566	12,188	2,236,438
Sandstone	41	595	7,167	1,615,444
Clay	31	555	2,199	1,215,882
Granite	24	263	2,850	731,484
Silica	18	327	1,784	689,886
Stone, misc.	30	168	2,114	568,783
Sand, Molding	12	146	1,673	441,648
Other Industries	<u>5</u>	<u>164</u>	<u>1,934</u>	<u>1,192,341</u>
Total	465	12,691	210,596	84,564,169

testing, that is, of deeper sands has developed two important gas areas. A partial vacuum method is used to obtain gas in some depleted fields. Pennsylvania's annual production has been declining and with the deeper phase of exploration completed, its future as a natural gas producing state will be put a matter of a few years, in all probability.

The Portland Cement Industry

For 40 years Pennsylvania has been the leading producer of Portland cement in the United States, at one time manufacturing more than 85 per cent of the total volume, and despite the great expansion in other states, it still produced 23 per cent of the total in 1931, when it produced 28,510,231 barrels, valued at \$30,952,302. The value added by manufacture was about \$20,000,000. Approximately 7,900 persons were employed in the industry in this State in 1930.

Natural cement is a product made by burning a clayey limestone to incipient fusion and grinding the product to a fine size. Portland cement, which is stronger and more dependable, is more carefully prepared, the material which is burned being in artificial mixture containing lime, silica, alumina and some iron oxide in definite proportions.

Three-fourths of the Pennsylvania product is made in the Lehigh cement district, where a clayey limestone, called "cement rock" furnishes a material ideally suited to the manufacture of Portland cement, requiring only a small amount of pure limestone or a little shale to give proportion of lime

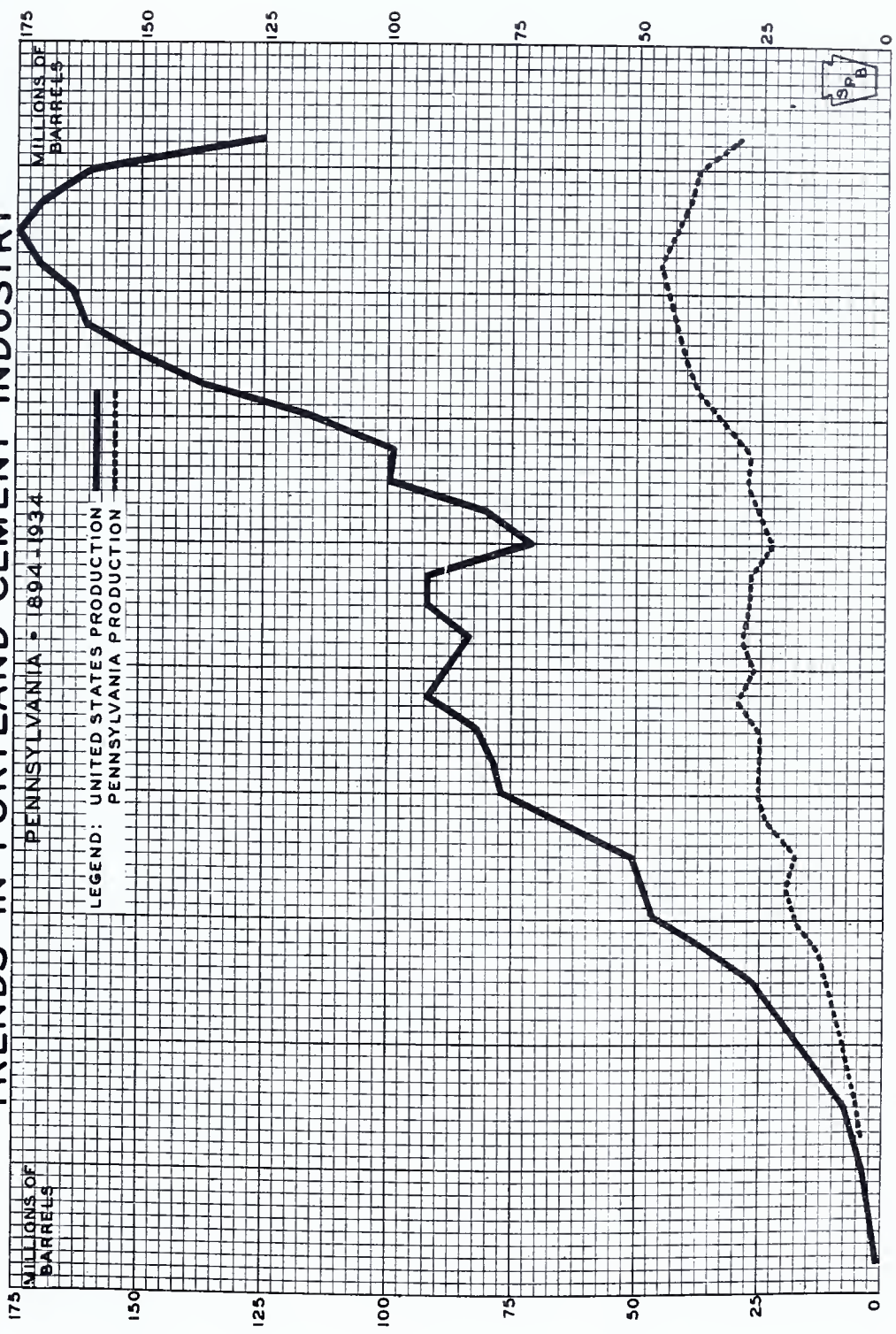
carbonate to the clayey substances.

The large consuming markets are in New York, New Jersey, and New England. At least 40 per cent is used for public and commercial buildings, houses, and sidewalks in urban communities. A large quantity, too, is used in highways, which increase in number and width as urban centers are approached, and for paving city streets.

In the last few years a change in the marketing of cement has come about which may affect the cement plants profoundly. Formerly cement was sold direct to the consumer. The cement companies made the contacts necessary to introduce goods, gave advice as to the mixing of concrete, and generally superintended its use. Much of this duty has now been taken over by the ready-mix companies which are springing up in every city. Their function is to buy the cement cheaply in large quantities, mix it with sand and gravel aggregate or crushed stone, and sell it ready-mixed to the building contractor or other users.

The Portland Cement Association has done much for the industry. It is one of the largest engineering, educational and scientific research organizations in the world, and aims to increase the knowledge, utility and use of Portland cement through scientific investigations and public education. Although it has no function in connection with individual manufacture or sales, it has promoted general sales and extended the demand for cement by its publications, information to newspapers and periodicals, instructions to users, and by mak-

TRENDS IN PORTLAND CEMENT INDUSTRY



ing staff assistants available for advice on job problems.

Common Rock Industries

Common rock material produced in Pennsylvania in 1929 are estimated to have totalled about 50,000,000 short tons and to have had a value of nearly \$65,000,000. Limestone made up about half of each of these totals, while sand and gravel and clay were next in order. A number of other rocks or rock materials contributed to the totals in smaller amounts.

Rock materials are used chiefly for concrete, plaster and road materials. Cement manufacturing ranks second both in tonnage and value of rock materials consumed, while the iron and steel industry, because of its demand for fluxing stone, and the clay-products industries are other large consumer. The lime manufacturing industry, the railroads (through demands for ballast) and a great number of other users account for smaller amounts.

Pennsylvania does not lead in the production of any of the building stones except roofing slate, but nevertheless, building stone other than slate produced in 1929 had a value of \$594,372, placed upon it by the United States Bureau of Mines. This figure undoubtedly is too small. Probably a considerable amount of building stone for local use is quarried when needed.

The Lime Industry

When finely ground limestone (calcium carbonate) is heated in kilns carbon dioxide is driven off, leaving calcium oxide, which is known as "quick-lime" or "lime." It has a high affinity for water, and when water is added it "slakes", forming a

hydrate of lime. When slaked lime is exposed to the air, it sets or becomes hard, due to evaporation of the excess water and the reversion of the calcium hydrate to calcium carbonate by absorption of carbon dioxide from the air.

The total value of lime sold by Pennsylvania producers in 1930 was \$4,661,670 and its bulk, 633,520 tons. Pennsylvania ranked second among the states as a lime producer.

Recently, mechanical means have been introduced to hydrate the lime, producing a fine white powder much easier to handle than quick-lime, and the product is an ever increasing percentage of the lime sold.

Lime for building purposes made up 18 per cent by weight of the Pennsylvania product in 1930. The chief use in building is in plaster. The building lime industry has been affected adversely by the recent enormous increase in the use of Portland cement and the increased use of gypsum wall plaster.

Although only 26 per cent of the lime produced in Pennsylvania in 1930 was used for agricultural purposes, the State produced 47 per cent of the Nation's total agricultural lime.

Pennsylvania was the leading state in chemical lime production in 1930 with 19 per cent of the United States total, both by weight and value. Chemical uses of lime are widely distributed throughout the industrial field. Metallurgical uses account for 14.5 per cent of the product; paper mills 6 per cent; tanneries 3.2 per cent; glass works and sugar refineries .5 per cent, while other chemical uses, each relative-

ly small, total 29.5 per cent.

Clay Products Industries

Pennsylvania has abundant supplies of most of the lower grades of clay. Much of the best pottery clay in the State has long been brought in from other states or even from abroad, and although enormous quantities of fire clay occur associated with the coal beds of Pennsylvania, the quantity of high grade fire clays in the State appears to be quite limited.

The clay-products industries of the Commonwealth had a product value of \$67,000,000 in 1929, and for the same year, 20,000 persons were employed by these industries. Clay products consist of common brick, paving brick, face brick, hollow tile, terra cotta, sewer pipe, roofing tile, refractories (heat resisting products,) etc. In 1929, Pennsylvania produced 37 per cent of the clay refractories manufactured in the United States and the combined production capacity of the refractories plants of Pennsylvania is said to be equivalent to 49 per cent of that of the whole country.

The raw materials used in the manufacture of many of the clay products are not required to pass rigid specifications as to properties. Other products, such as refractories, Pennsylvania's particular specialty, must be made from clays of high purity, which makes it necessary in practice to discard, or not to mine at all, large proportions of the available deposits.

Preliminary study has convinced us that if processes could be developed that would make possible the removal of some of

LOCATION OF THE SEVERAL BRANCHES OF THE GLASS INDUSTRY IN PENNSYLVANIA AS SHOWN BY LOCATION OF PLANTS AND THEIR NUMBER OF EMPLOYEES. (BASED ON SEVENTH INDUSTRIAL DIRECTORY OF PENNSYLVANIA, 1930). ONLY PRIMARY PRODUCTS ARE CONSIDERED.

Plants	Bottles & Jars Employees	Cut Glass Employees	Decorative Glass Employees	Plate Glass Employees	Table Ware Employees	Window Glass Employees	Miscel. Glass Employees	All Pri- mary Glass Employees								
Allegheny.....	6	1	2	14	166	2	2,029	1	600	..	..	8	1,313	32	4,801
Armstrong.....	1	..	..	..	..	1	1,398	..	..	..	..	1	6	3	1,480
Beaver.....	..	?	..	..	..	..	..	1	100	..	..	2	946	4	1,046
Barks.....	..	..	..	1	62	..	..	..	..	..	..	1	2	2	64
Blair.....	..	..	..	..	..	..	..	..	..	..	..	2	4	2	4
Butler.....	..	..	..	..	..	1	398	..	..	..	..	1	41	2	439
Clarion.....	2	..	..	..	..	..	..	..	..	..	..	..	..	2	360
Dauphin.....	..	..	..	1	15	..	..	..	..	..	..	..	..	1	15
Elk.....	1	..	..	..	..	1	437	..	..	..	..	..	..	2	438
Fayette.....	1	..	..	..	..	..	..	..	..	2	516	3	412	6	1,438
Forest.....	1	..	..	..	..	..	..	..	..	..	..	..	..	1	72
Indiana.....	..	..	..	..	..	1	493	1	198	..	..	..	..	2	691
Jefferson.....	2	..	..	..	..	..	..	..	..	..	..	2	..	2	285
Lackawanna.....	..	..	..	1	4	..	..	..	..	..	..	2	28	3	32
Lancaster.....	..	9	..	1	37	..	..	..	..	..	..	..	..	3	46
Lehigh.....	..	..	..	1	6	..	..	..	..	..	..	..	..	1	6
Luzerne.....	..	..	..	2	20	..	..	..	..	2	..	2	185	6	673
McKean.....	1	..	..	..	..	1	42	..	..	..	..	..	..	1	7
Monroe.....	..	7	..	..	..	..	..	..	..	..	..	..	..	1	7
Montgomery.....	3	..	..	..	..	..	..	..	..	..	..	4	114	7	310
Philadelphia.....	1	3	7	15	112	1	12	..	..	1	147	11	130	32	417
Pioga.....	..	6	..	..	..	..	..	..	..	..	..	1	230	2	236
Venango.....	1	..	..	..	..	..	..	..	..	..	..	..	..	1	83
Warren.....	1	..	..	..	..	1	263	1	123	..	..	2	1,090	7	126
Washington.....	2	..	..	1	61	..	..	..	..	..	..	..	..	1	3,312
Wayne.....	..	14	..	..	..	..	..	..	..	..	..	..	..	1	14
Westmoreland.....	..	..	..	1	5	1	7	4	1,224	1	216	4	737+	11	2,189+
York.....	..	..	..	1	10	..	..	..	..	..	..	1	13	2	23
TOTAL	23	4,300	10	45+	39	498	10	5,069	8	2,245	6	1,219	45	5,251+	141	18,627+

the objectionable impurities in clays, not only could the properties of the finished products be improved, but, in addition, large quantities of raw material now discarded or neglected could be used to manufacture valuable products. This is especially true of refractories or heat-resisting brick and other shapes that are absolutely essential in furnace construction in the iron and steel and other metallurgical industries, in by-product coking and glass making. Research to develop such beneficiation processes is essential if Pennsylvania is to maintain its high standing in the clay-products industries.

Non-Clay Refractories

Refractories may be divided conveniently into the following groups: Fire-clay, silica, Magnesite, chrome and high-temperature cements. The most important of Pennsylvania's non-clay refractories in terms of value is silica brick. The State's output in 1929 was valued at \$10,452,622. Silica brick has an extensive use in metallurgy.

Magnesite and chrome refractories are also used chiefly in metallurgy. The combined value of Pennsylvania's output in 1929 was about \$4,000,000 while that of high-temperature cements was \$2,685,183.

For convenience, abrasives and grinding wheels may be grouped with refractories. The industry is based largely upon the use of silicon carbide and electrically fused aluminum oxide. Rottenstone, and earthy siliceous material, is the only natural abrasive originating in Pennsylvania, but an abrasive

and grinding wheel manufacturing industry has plants in Philadelphia, Beaver and Chester counties with reported product value in 1928 of \$3,000,000.

The Glass Industry

Pennsylvania was the leading glass-producing state in the Union in 1929 with a value of products amounting to \$81,050,092 and a value added by manufacture of \$50,907,037. It produced 26 per cent of the nation's glass in terms of products.

Plate glass and bottles and jars make up more than half of the total value of glass products. Cut and decorative glass, table-ware and window glasses are other important divisions of the industry.

A total of 141 glass making establishments with 18,630 employees were in operation in the State in 1930. The trend has been toward specialization and large-scale production.

Machinery has been introduced steadily in the industry since 1900, automatic devices displacing skilled labor.

As a result, the industry finds itself in something of a transition stage, changing from hand to machine processes with about half of the establishments taking advantage of existing machinery.

Iron and Steel

The United States is by far the leading producer of iron and steel, and within the United States, Pennsylvania leads that industry. Within Pennsylvania, Pittsburgh dominates the

picture.

While Pennsylvania produced only one per cent of the nation's iron ore in 1931, it easily led other phases of the industry with 28 per cent of the total pig iron tonnage and 32 per cent of the total tonnage of steel ingots and castings.

The making of iron and steel (with a total product value in 1929 of \$1,493,588,384 and a value added by manufacture of \$548,697,674) is by far the State's leading manufacturing industry, accounting for 16 per cent of all value added by manufacture in 1929. In the same year the average number of persons employed in the industry in Pennsylvania, according to the United States Census, was 168,500. The 1930 Productive Industries report of the Pennsylvania Department of Internal Affairs estimated the capital invested in the iron and steel industry to be between \$700,000,000 and \$800,000,000. But such figures do not fully describe the value of the industry to the Commonwealth. Account must also be taken of the way in which it has attracted or made possible the development of a great many other manufacturing industries.

Pig iron, result of the blast furnace or electric smelting of iron ores, may be made into cast iron in a foundry, into wrought iron in a puddling mill, or converted into steel, that is iron with carbon added.

Production of 1,000 tons of pig iron requires about 1,800 tons of ore, 700 tons of limestone as a flux, 1,000 tons of coke, and 4,500 tons of heated air. Moulten iron is drawn off

every four hours. A second product, slag, is still largely waste, but has a widening field of uses, among which are railroad ballast, road surfacing, the manufacture of cement in some localities, and fertilizer.

Increase in the carbon content increases the hardness and brittleness of steel, but weakens it by a decrease in toughness, malleability, and ductility. Numerous alloy steels exist to which various metals are added to impart special qualities.

Steel is made by any of four types of processes, the Bessemer, the open hearth, the electric furnace or the crucible process. The open hearth processes are slower than Bessemer but result in a higher, more uniform grade of steel and 89.5 per cent of Pennsylvania's steel was made this way in 1931.

Coincident with the phenomenal rise in the production of iron and steel has come the integration of the industry. Eighty-nine per cent of the ingot capacity of the United States was controlled by ten companies in 1931, with the United States Steel Corporation controlling 43.3 per cent of the ore shipped from all mines in the United States, 20.9 per cent of the coke produced, 38.1 per cent of the pig iron and ferro-alloys, 38.9 per cent of the steel ingots and castings and 34.2 per cent of all kinds of finished rolled products. The Bethlehem Steel Corporation has about one-third as large a capacity as the United States Steel Corporation.

The United States Steel Corporation and the Jones and

Laughlin Steel Corporation are the largest iron and steel organizations in extreme western Pennsylvania; the Bethlehem Steel Company (chief operating subsidiary of the Bethlehem Steel Corporation) is outstanding in eastern Pennsylvania, and both the larger companies are represented in Johnstown.

Within recent years, an increasing use of scrap iron has developed and, in consequence, an excess of steel produced over pig iron used reached more than 14,000,000 gross tons in 1929. The re-use of old steel and iron which this difference represents is very desirable from the standpoint of conservation. It is, moreover, a tendency which must be taken into consideration in estimating the probable time of exhaustion of the iron ore deposits.

Several influences have been tending to decentralize the iron and steel industry. When the industry turned from beehive to by-product coke, development of plants some distance from the source of coal became possible. Abolition of the "Pittsburgh plus" system in 1924 promoted this decentralization still further so far as western Pennsylvania is concerned. (For many years quoted by steel products manufactured at, and shipped from, points outside of Pittsburgh were the regular F. O. B. Pittsburgh prices plus amounts equivalent to the railroad freight charges on such products if shipped from Pittsburgh.)

The curves showing proportions of the United States total production of iron and steel products contributed by the various districts of Pennsylvania as a whole and by competing

districts and states, bring out only too clearly that some shift in the industry is going on. Pennsylvania is steadily declining in relative importance as a producer, while the Chicago-Gary district and some others are increasing in importance.

Exhaustion of the Lake Superior deposits, which produce more than 85 per cent of the country's iron ore, is not to be expected for forty or fifty years. When this tonnage does decline, the industry probably will obtain more and more of its ore from abroad and from the great reserves of low-grade ore in southeastern United States.

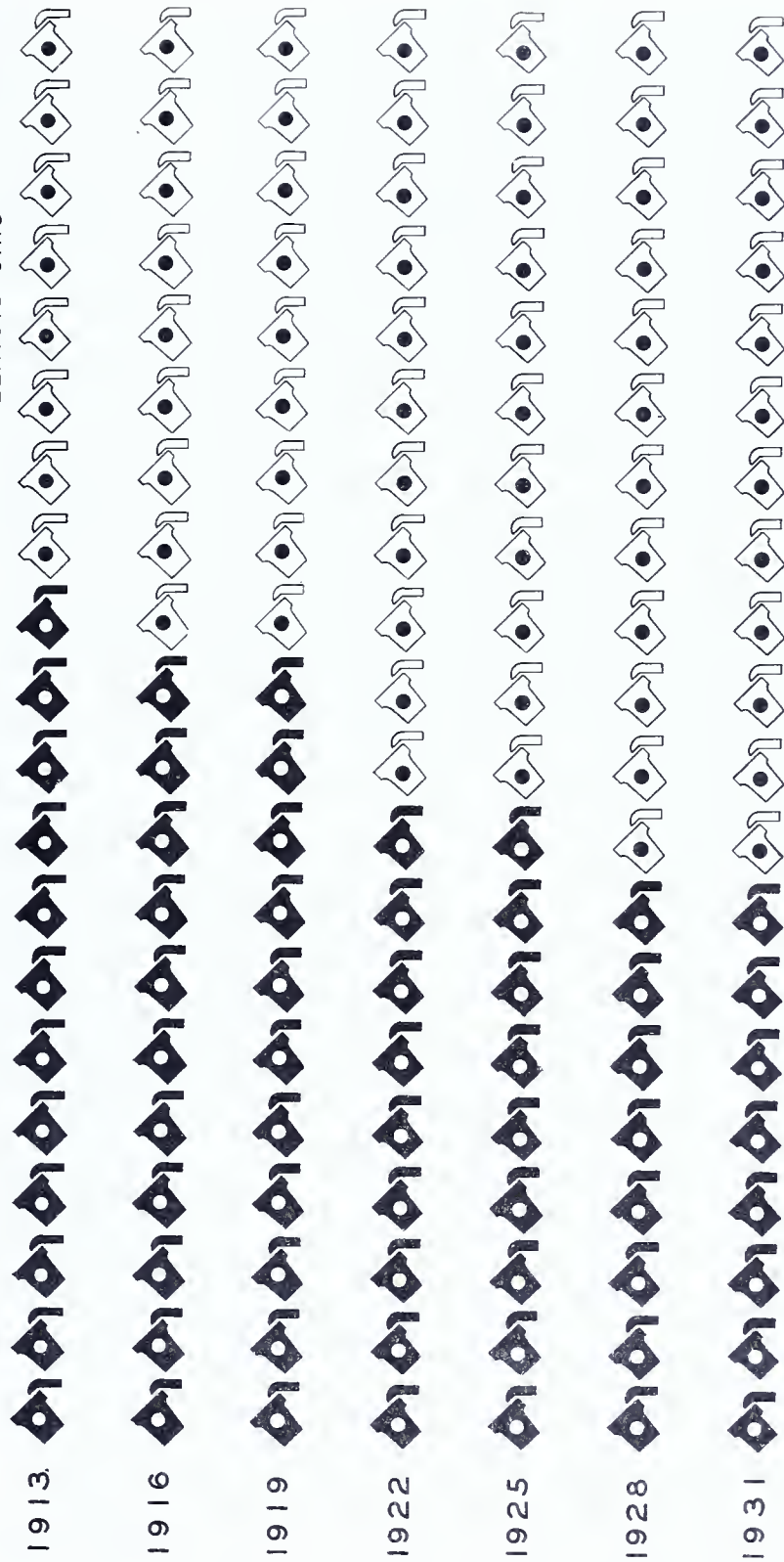
Increasing dependence on foreign ore is likely to result in a gradual migration of the iron and steel industry in the United States to the Atlantic Coast, -- a movement in which the Bethlehem Steel Company, with its plant at Sparrow's Point, Md., may be considered a pioneer.

Studies of Pennsylvania's Iron Ore and Chromite Reserves
--and of Possible Methods for their Beneficiation.

Pennsylvania became the center of the iron and steel industry in the United States primarily because of her abundant deposits of iron ore, plentiful supplies of fuel and of limestone for fluxes, and favorable location with respect to consuming markets. When high grade iron ores were discovered in the Lake Superior region with accompanying cheap large scale mining and handling methods, Pennsylvania ores were driven out of the markets. The crude and inefficient methods used in the days of Pennsylvania iron ore mining may have had something to

PENNSYLVANIA

INDIANA ILLINOIS OHIO



HOW PENNSYLVANIA STEEL INDUSTRY
IS LOSING TO MID-WEST FIELD

do with this shift, which left, it is generally agreed, large unmined low grade reserves in Pennsylvania.

The early exhaustion of high grade ores in the Lake district has been predicted by experts. It is probable that serious decrease in the flow of ore from the rich Lake Shore deposits will begin long before their exhaustion forty or fifty years hence. Then attention will focus on the lower grade deposits of the country and Pennsylvania may again become important as an iron ore producer.

Two lines of study seem to be promising. (1) Careful prospecting, especially by the use of the newer geophysical methods, may well locate important unknown iron ore bodies in the State, especially in the regions where ores are magnetic. (2) Studies leading to the improvement of beneficiation methods such as crushing, screening, drying, washing, jigging, electromagnetic separation, smelting, nodulizing, desulfurization, etc., should make possible the use of our lower grade iron ores. Such methods are already in extensive use in the Lake Superior district. In that region they are making possible the use of lower grade ores as the better ores are being exhausted. Recognizing this fact, the State of Minnesota has for some years been engaged actively in a study of beneficiation methods of Minnesota ores.

During the last twenty years chromium and its compounds have become of paramount importance in metallurgical and chemical uses. Chromium imparts valuable properties to steels and

and other alloys, which chromium compounds are exceeding important in refractory, tanning, dyeing and other uses. At present most of the chromium used in the United States must be imported. Pennsylvania has produced chromium in the past but produces none at present. Chromite is magnetic and it is possible that the same magnetic prospecting referred to above as applicable to iron ore finding might reveal some valuable chromite deposits.

Other Metal Industries

The non-ferrous metal industries of Pennsylvania had a total product value of about \$78,000,000 and a value added by manufacture of about \$29,000,000 in 1929. No mines are operated primarily for the ores of any of this group, although some copper, gold and silver are obtained as by-products in mining iron ore at Cornwall.

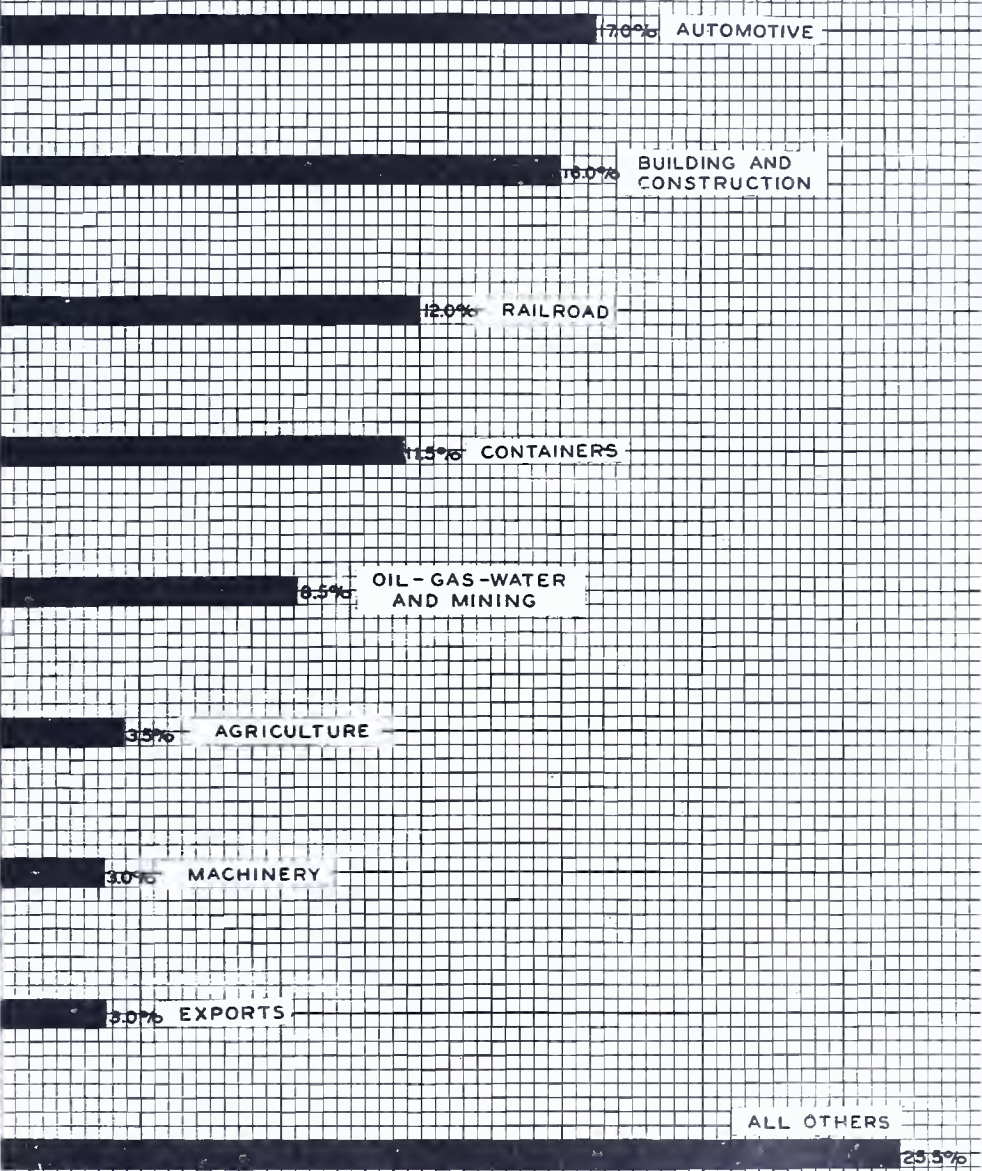
Zinc was formerly mined extensively in Lehigh County and some zinc deposits are known elsewhere in the State. Lead has been mined in central Pennsylvania and in Chester County. Some deposits of copper minerals occur in the southeastern part of the State and mines have been operated for short periods, but with little success.

The smelting and refining of zinc from ores or concentrates had a product value of \$34,843,205 in Pennsylvania in 1929 and a value added by manufacture of \$17,854,327. The industry gave employment to 3,845 persons.

Pennsylvania has risen in relative importance in the zinc

INDUSTRIES CONSUMING FINISHED STEEL

UNITED STATES • 1932



industry and the addition of a plant near Monaca should still further add to the State's relative importance.

A number of plants in the State are engaged in making brass and bronze and other non-ferrous alloys from scrap; or in some type of recovery of metals from waste materials. On the basis of available data the total value of the State's secondary metal industries was about \$43,000,000 in 1929 and the value added by manufacture about \$11,000,000.

TENTATIVE STUDY
Of The Economic Geographic Regions
of Pennsylvania*

On the adjoining map Pennsylvania is divided into twenty-five geographic Regions, areas which are essentially uniform throughout both in their natural environmental conditions and in dominant human use forms. These divisions are purely tentative and are by no means complete; they are designed only as working units in studying the economic geography of the State. Any one of these regions or a part of any region may form a unit for detailed investigation.

Unlike agricultural regions geographic regions are based upon all forms of utilization as well as upon the appearance of the regions. In some parts of the State, agriculture is dominant and types of agricultural use serve to set off one region from another; in other parts mining or manufacturing predominates and forms the basis for regional divisions.

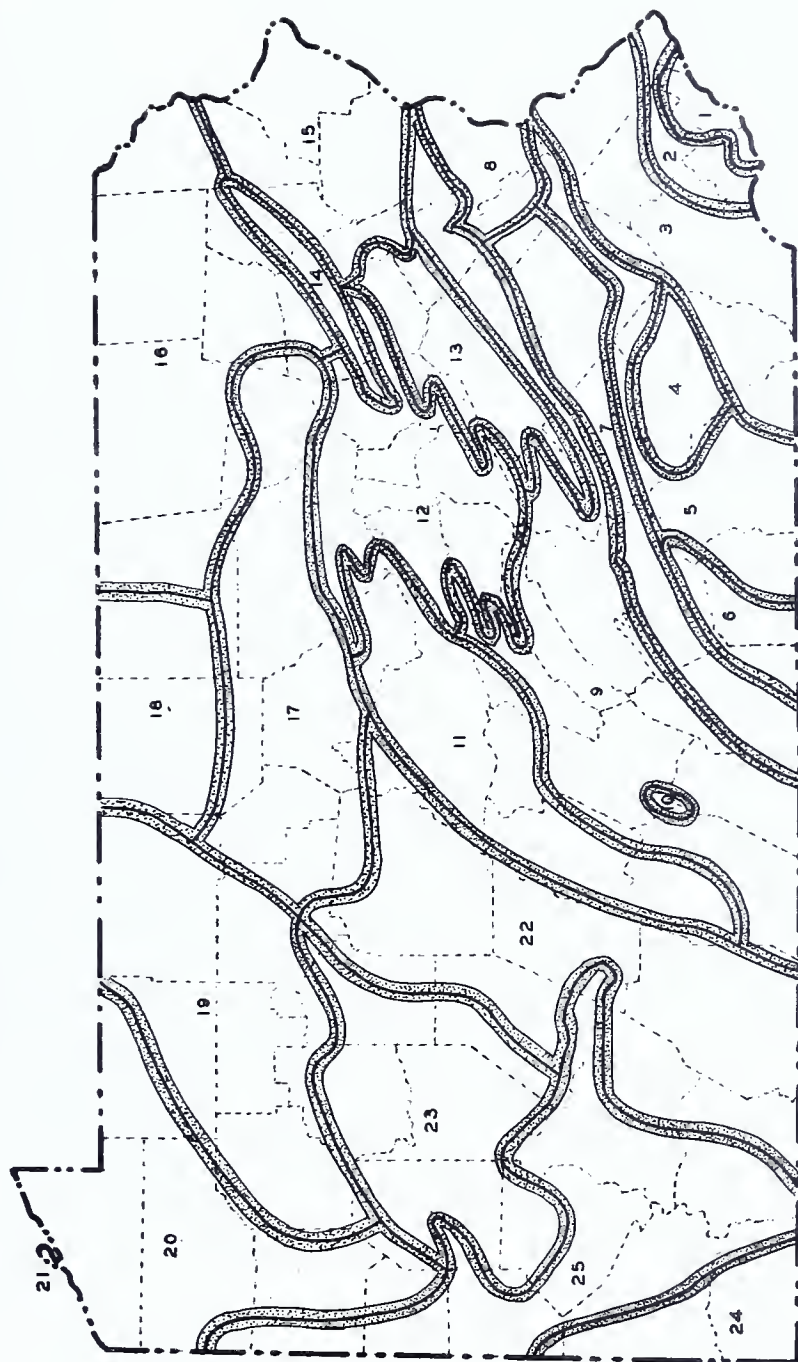
DESCRIPTION

I. Philadelphia Urban District.

As its name implies this region consists of the City of Philadelphia, a great urban center, in which manufacturing and commerce are the dominant activities. Chester is included as being essentially a part of urban Philadelphia.

*By Raymond E. Murphy, Ph.D., Assistant Professor of Economic Geography, School of Mineral Industries, Pennsylvania State College.

ECONOMIC GEOGRAPHIC REGIONS 1934



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FIGURE NO. 72

R.E. MURPHY.

II. Philadelphia Suburban Area.

A suburban and part-time farming region borders the urban district.

III. Southeastern Dairy Region.

This is a region dominated by agriculture in the form of a dairy industry but dotted with small semi-industrial cities.

IV. Lancaster County Tobacco Region.

An agricultural region dominated by one crop, tobacco, and with one important industrial center, Lancaster.

V. Southeastern Diversified Farming Region.

This region, consisting of York County and a strip extending on toward the northeast, is predominantly an agricultural region in which poultry raising, dairying and several other types of farming vie with one another for leadership. York is an important industrial city, and a number of smaller urban centers, too, show a high degree of industrialization. Metal products, cigars and furniture are outstanding manufactures.

VI. South Mountain Fruit and Resort Region.

A region dominated by a topographic feature, South Mountain. Much of the land is left in forest and locally supports a resort industry; but the edges of South Mountain are in many places used for agriculture with apple production dominant.

VII. Great Valley Agricultural and Industrial Region.

This long strip of the great Appalachian Valley is a region of diversified farming but is dotted with a number of important industrial centers, among which are Harrisburg,

Reading, Lebanon and Carlisle. Textiles, iron and steel, metal goods and food products are important manufactures.

VIII. Lower Lehigh Valley Industrial Region.

The lower Lehigh Valley is dominantly industrial, with Allentown, Bethlehem and Easton as important urban centers. The cement industry, iron and steel manufacture, slate quarrying and the making of textiles and textile products are among the outstanding activities.

IX. Appalachian Ridge and Valley Region.

Forested ridges alternate with agricultural valleys in this region, the forested ridges being slightly more characteristic. Diversified farming is the predominant type of agriculture.

X. Broadtop Coal Field.

A small plateau-like bituminous coal producing area surrounded by the ridges and valleys of central Pennsylvania.

XI. Appalachian Limestone Valleys Region.

Though this region consists of alternating ridges and valleys like Region 9, the valleys are more extensive than the ridges and support an agriculture in which dairying is dominant. Altoona, Lewistown and Huntingdon are some of the industrial towns that are scattered over this region. In these urban centers textile mills, refractory plants and railroad shops employ many of the industrial wage earners.

XII. Susquehanna Valley Agricultural Region.

Lowlands along the Susquehanna with diversified

farming dominant, but with some industrial development in the small urban centers.

XIII. Southern Anthracite Fields.

The three southernmost anthracite fields, the Southern Western Middle and Eastern, are here considered as a group because they are essentially continuous. Anthracite mining is the dominant activity, but the urban centers have also developed manufacturing, textiles and textile products being particularly important.

XIV. Wyoming Valley.

This is another anthracite region, separated from and north of the three just mentioned. Settlement is slightly more concentrated here than in the southern anthracite fields. Again, anthracite mining is dominant, with textile and metal products manufacturing as important sidelines.

XV. Pocono Resort Region.

The rugged, glaciated country of the Poconos is the site of an important resort industry, while agriculture is restricted to serving in part of the needs of the resorts.

XVI. Northeastern Dairy Region.

This is a highly specialized dairy section with few urban centers and little industrial development.

XVII. Allegheny Mountains Forest Region.

A rugged region of many state forests and little cleared land.

XVIII. North Central Gas and Farming Region.

With a larger percentage of forest land than the Northeastern Dairy Region, this region has as its agricultural specialities, dairying and potato growing, but natural gas production has attracted increasing attention with recent years.

XIX. Upper Allegheny Oil and Gas Region.

Forests occupy much of the surface of this region. Petroleum production and refining dominate, with McKean County leading the state in crude oil production, and Oil City, Franklin, Titusville and Bradford standing out as refining centers.

XX. Northwestern Dairy Region.

An agricultural section devoted principally to dairying, with Meadville as the largest industrial town.

XXI. Erie Urban and Fruit Region.

This region includes Erie, a manufacturing and commercial city in which metal products are the outstanding manufacture. It includes also the lake shore belt with its important grape industry.

XXII. Allegheny Mountains Coal-Mining Region.

This high portion of the Plateau, frequently called the Allegheny Mountains, is dominated by the soft coal mining industry, while some of the larger urban centers manufacture clay products. The forest cover is widespread and agriculture is not of great importance.

XXIII. Middle Allegheny Agricultural and Mining region.

In this region general farming, coal mining and the oil and gas industry are all of considerable importance.

XXIV. Southwestern Sheep Region.

This hilly section is best adapted to its principal form of utilization, sheep raising. The presence of large bituminous coal reserves, however, suggests that coal mining may some day be the dominant utilization form of this region.

XXV. Western Pennsylvania Industrial and Mining Region.

A coal mining industry characterizes all of this region, while industrial development is important in the cities, the iron and steel industry being particularly outstanding. Pittsburgh, Johnstown, New Castle, Connelsville and Uniontown are some of the industrial centers of this region, their industries depending particularly upon coal. Agriculture in so far as it is present is designed to serve the mining and industrial centers. The Shenango Valley, the Uniontown-Connellsville area and the city of Pittsburgh are some of the important subregions into which this major might well be divided.

PLANNING FOR "REASONABLE COMFORT"*

Approximately nine in every ten of Pennsylvania's families had incomes, even in 1929, that were inadequate for the complete attainment of reasonable comfort. In fact, many did not have enough for their basic needs. The average income was sufficient to buy only three-fourths of the things regarded as virtual necessities for an American standard of living.

Moreover, the standard of living of these and other families today is lower than in 1929.

Pennsylvania's income in 1929 was between \$7,500,000,000 and \$8,000,000,000, according to estimates based on totals for the United States, which were prepared by various agencies. A study of expenditures by the people of the State for clothing, food, rent, transportation, recreation, amusements, health and other things led to the conclusion that the State's income was, in round figures, \$7,500,000,000.

In the following pages a budget for the reasonable human needs of the population has been fixed at \$9,910,000,000 or \$4375 for each "statistical private family" of 4.23 persons

* Ultimately, if we are to plan a sound civilization, we must think, essentially, in terms of the needs of citizens. This section is submitted as an attempt to face this problem. We appreciate, of course, that prices mentioned are based on an economy of scarcity while the outline of goods is based on one of abundance. The prices allow for existing returns to capital. The approach and attitude are more important than are any of the detailed estimates submitted. Sources and methods used are appended.

(see appendix) in 1929 dollars. Adjusted to the purchasing power of the 1934 dollar, the minimum income for each family in the Commonwealth should be \$3500 or, for a single individual, \$829 a year. But in 1929 only 12 per cent of the population received such incomes. Consequently 88 per cent received less than enough for reasonable requirements.

In the United States the words "human needs" connote more than the bare necessities to sustain a miserable existence. So, in classifying them for Pennsylvanians, a reasonable standard of living has been kept in mind. "Human needs, then, are such essentials as food, shelter, clothing, health protection and at least that minimum of recreation and amusement requisite for well-being and comfort. They include the means for education, transportation, and other services and goods in adequate quantity to satisfy the reasonable desires of the average individual and the average family. They stop far short of extravagances. In other words, they constitute an "American standard" of living.

National inventories of income, rounding out into billions of dollars in consumers goods and services, all provide an auspicious asset side of the balance sheet. But liabilities also must be considered. Do they exceed the assets?

Any national inventory becomes the asset side of the balance sheet, and the human needs or demands, the liabilities. National income was variously estimated for 1929, but with a general agreement that it was in the neighborhood of ninety

billion dollars. The National Survey of Potential Product Capacity placed it at \$95,400,000,000 while the Brookings Institute calculated it at \$91,385,000,000. This was for an America operating, according to the findings of the same institute, at approximately 80 per cent of capacity.

Yet, with this 80 per cent capacity, millions of people in the United States lacked a sufficiency of goods and services in 1929. For example, the 29,000,000 men and boys' suits produced in that year was at a rate which would allow about one suit every two years for each individual. A production of a trifle more than 9,250,000 overcoats would allow these same men and boys a new overcoat only once in six years. A striking shortage also was shown in housing units available and in the health and comfort of the homes.

Most of the figures upon which estimates can be based are national statistics for 1929. In order to arrive at an estimate for Pennsylvania, its share must be computed on the basis of its population and the number in each age group. At the end of this section of the report, the figures are reduced to a 1934 basis.

In the present survey, several of the principal human needs have been "budgeted". Others have been roughly estimated to round out the picture.

Food

The food budget becomes a problem of diversification of foods rather than a question of quantity. One adequate for

Pennsylvania's 9,631,000 people, on the basis of 1929 price levels, would require an average outlay of \$15 a week for each family, according to a bulletin published by the United States Department of Agriculture.

Food supplies in 1929 were found ample in quantity but not in variety. If we round out the diet by a decrease in the production of foods containing starch, sugar and protein, and an increase in mineral and vitamin foods such as milk, fresh vegetables and fruits, the acreage necessary to supply the requirements would be less than that under cultivation from 1928 to 1932. The number of cattle, hogs and sheep and the quantity of poultry would likewise decrease, although the number of milch cows would have to be increased to supply the larger consumption of milk called for in the diet. If beverages and spices are added, the bill for the State would be \$2,040,000,000 a year, or about \$20,000,000 less than was spent in 1929.

Wearing Apparel

The wearing apparel budget, in greater part, has been adapted to the needs of the Commonwealth's population from the findings of the National Survey of Potential Product Capacity. Men and boys formerly limited to one suit every other year are allotted one a year, or even two, depending upon occupation and age. Likewise, the number of overcoats has been increased from one every six years to one every two years. Women and girls receive thirteen dresses and frocks every two years, almost double the 1929 allotment, thirteen pairs of stockings

a year instead of ten, and ten pieces of underwear compared with four and a half in 1929.

Pennsylvania's dress bill for 1929 could not have exceeded \$300,000,000 but the actual needs as expressed in the new budget increases this amount by about 75 per cent to \$1,377,000,000 or from less than \$80 a year for each person, at 1929 prices, to slightly more than \$140.

Housing

Agreed minimum standards of housing allot one room to each individual, exclusive of bath facilities. The total cost of a four to five room unit including the cost of land, under any large scale program, is \$5,000. When modern methods are utilized, the cost is approximately the same whether the unit is contained in a large apartment structure or single dwelling. With the life of these properties set at forty years, an annual replacement of 298,000 rooms is needed, at a cost of approximately \$200,000,000.

Ten per cent of the value of the property or about \$992,000,000, is the rental budget for Pennsylvania, amounting to a little more than \$435 a year for the "statistical family" of 4.23 persons----roughly \$8.50 per month per room.

Health

The health bill of the people of Pennsylvania in 1929 exceeded \$250,000,000 and averaged \$26 to \$30 per capita. Medical facilities and personnel during a reasonably comparable period were inadequate in all but the number of nurses.

For each 100,000 persons, the State had 124 physicians, 57 dentists, 266 nurses, 16 public health nurses and 886 hospital beds. Careful studies by the Committee on the Cost of Medical Care have fixed the lowest numbers for adequate care of the people at 142 physicians, 179 dentists, 99 dental hygienists and laboratory technicians, 176 hospital and home nurses, 44 public health nurses and 1,158 hospital beds.

Opinion varies upon the cost of health service for each individual if purchased yearly upon a group basis. The Milbank Memorial Fund computed the figure at \$42, while the Committee on the Cost of Medical Care gave an estimate of \$36, or \$25.30 for medical expenses and \$10.70 for dental expenditures. On the latter basis, Pennsylvania's annual health bill would be slightly more than \$345,000,000.

Recreation and Amusement

Reasonable estimates place the expenditures of the people of the Commonwealth in 1929 at approximately \$470,000,000 for public and private sports, theatres, music, vacations, (excepting automobile travel), foreign travel and other miscellaneous amusements and private social activities. However, the people's capacity for recreation, travel and amusement is such that this "play bill could be doubled with beneficial effect upon the population as a whole. It would then be roughly \$2 per week per person which does not seem extravagant.

Transportation

A transportation budget should include passenger transportation by automobile, bus, electric railway and railroad, and in some instances by water. If we were to provide an automobile for each of the statistical families in the State, more than 2,275,000 cars would be needed. The life of an automobile averages about six and three-quarters years, which means an annual replacement of 337,000 cars, costing roughly \$214,000,000.

Cost of gasoline, lubricants, tires and tubes and maintenance would be \$973,000,000 provided that the average mileage operated each year did not exceed 11,000 miles per car. Garage rental would amount to approximately \$136,000,000.

Common and contract passenger transportation, exclusive of commercial passenger traffic, if increased 25 per cent over the 1929 expenditures, would amount to \$250,000,000. All totalled, including miscellaneous expenditures, Pennsylvania's transportation bill would amount to \$1,582,000,000 a year.

SUMMARY

Expenditures in 1929 for clothing, food, rent, transportation, recreation, amusements and health amounted to approximately \$5,305,000,000. Education was not listed separately, nor were savings and insurance, but were placed in a group with "all other expenditures." This also included house furnishings and services, personal needs and various

other things, totalling another \$2,195,000,000. Thus, in round numbers, the expenditures in 1929 of the people of the Commonwealth totalled \$7,500,000,000, or virtually the same amount as the estimated income for that year. A rough estimate of other needs has been reached arbitrarily by increasing by 20 per cent the unallocated expenditures. Pennsylvania's budget for the achievement of "reasonable comfort" will then look as follows:-

	Amount in Millions of Dollars
Food.....	2040
Wearing apparel.....	1377
Rent.....	992
Health.....	345
Amusements and Recreation...	940
Transportation.....	1582
All other.....	<u>2534</u>
Total	9910
1929 income	<u>8000</u> to <u>7500</u>
Deficit	1910 2410

This budget of \$9,910,000,000 represents a minimum for each of the State's 2,276,915 families or for each of its 9,631,000 individuals, if goods and services are expressed in 1929 dollars. Therefore, each statistical family of 4.23 persons, as already stated, needs \$4375, in 1929 dollars or \$3506 when adjusted to the purchasing power of the dollar of 1934 as its minimum annual income. But while the income is set forth as a minimum requirement, this discussion is of the average, not the minimum family. Those smaller than the average of 4.23 would require less. The requirements of a single individual cannot be completely met by less than \$329

PENNSYLVANIA FOOD BUDGET

(Pounds per year except milk and eggs)

Item	Last three ciphers omitted Amount
Flour, Cereals.....	1,544,473
Wheat flour.....	1,173,800
Corn Meal.....	154,447
Prepared Flour.....	46,334
Oat Breakfast food...	46,334
Rice.....	30,889
Macaroni, Noodles....	30,889
Wheat breakfast foods	15,445
Rye flour.....	15,445
Corn Breakfast foods.	15,445
Cornstarch.....	15,445
Potatoes, Sweet-	
Potatoes.....	1,559,960
Potatoes.....	1,294,767
Sweet Potatoes.....	265,193
Dried Beans, Peas & Nuts.....	197,003
Dried beans.....	88,651
Peanuts.....	65,011
Dried peas.....	9,850
Nuts (in shell).....	33,491
Tomatoes, Citrus Fruit..	882,147
Tomatoes, fresh.....	132,322
Tomatoes, canned.....	308,751
Oranges.....	282,287
Grapefruit.....	88,215
Lemons.....	70,572
Dried Fruits.....	257,668
Raisins.....	103,067
Prunes.....	103,067
Others.....	51,534

FOOD BUDGET
(Pounds per year except milk and eggs)
(Continued)

Item	Last three ciphers omitted Amount
Leafy Green or Yellow Vegetables.....	947,026
Cabbage.....	473,513
Lettuce.....	170,465
Peas.....	104,173
Snap beans.....	56,822
Carrots.....	47,351
Spinach, Kale, collards, etc.....	47,351
Asparagus.....	28,411
Peppers.....	18,941
Other Vegetables & Fruits.....	1,963,432
Apples.....	667,567
Bananas.....	215,977
Grapes.....	215,977
Peaches.....	176,709
Corn.....	157,074
Onions, turnips, beets, etc.....	117,806
Watermelons.....	98,172
Cantaloups.....	78,537
Pears.....	78,537
Cucumbers.....	39,269
Celery.....	39,269
Strawberries.....	39,269
Pineapples.....	39,269
Fats.....	491,675
Butter.....	245,838
Lard.....	98,335
Vegetable Oils & Shortenings.....	98,335
Bacon, salt pork.....	34,417
Margarine.....	14,750
Sugar, Molasses.....	565,411
Sugar.....	424,058
Molasses.....	90,466
Other.....	50,887

FOOD BUDGET
(Pounds per year except milk and eggs)
{Continued}

Item	Last three ciphers omitted
Lean Meat, Poultry & Fish.....	Amount 909,302
Beef.....	309,163
Pork.....	354,628
Veal.....	45,465
Lamb & Mutton.....	27,279
Poultry.....	100,023
Fish.....	72,744
Eggs. (dozen).....	156,453
Milk. (quarts).....	2,879,903
Fresh whole milk.....	2,793,506
Condensed & Evaporated.....	86,397
Coffee.....	91,498
Spices.....	1,849

WEARING APPAREL BUDGET

BABIES UNDER ONE YEAR

Item	Sex	
	Male	Female
Shirts	255,906	246,657
Skirts	255,906	246,657
Slips	341,208	328,876
Diapers	3,070,872	2,959,884
Socks (Pairs)	170,604	164,438
Sacques	170,604	164,438
Cloaks	85,302	82,219
Mittens (Pairs)	85,302	82,219
Caps	85,302	82,219

WEARING APPAREL BUDGET

CHILDREN ONE AND UNDER FIVE YEARS

Item	Sex	
	Male	Female
Coat	368,770	360,024
Suit	2,212,620	
Dress		2,160,144
Underwear	2,212,620	2,160,144
Sleeping Suits	737,540	720,048
Hose	2,950,160	2,880,192
Shoes	1,106,310	1,080,072
Caps & Hats	737,540	720,048
Gloves & Mittens	737,540	720,048
Sweaters	737,540	720,048

ANNUAL BUDGET FOR INDIVIDUALS

MALE	5-14 years	15-64 years	65 yrs & over	FEMALE	5-14 years	15-64 years	65 yrs & over
Work Gloves		1.5		Handkerchiefs	5.6	10.8	10.9
Ties	3	5.2	3	Garters	2	2	2
Handkerchiefs	4.5	8.5	8.6	Gloves	1.6	3.4	2.4
Garters	1	1	1	Sweaters	1.3	.5	.5
Gloves	1	1.1	.6	Hate	2	3	1
Suspenders		.5	.5	Shoes (Pairs)	3.3	3.4	1.7
Collars		2.5	2.3	Sleeping Apparel, Kimo- nos, Bathrobes	2.1	3	2
Work Shirts		2.3		Corsets, Girdles, Etc.		1.8	.7
Corduroys		.8		Brassiers		1.5	1
Overalls		1.5		Underwear	6.6	8.2	3.9
Mackinawe		.3		Hosiery (Pairs)	10.3	13	7.4
Sweaters	1	.5	.5	Suits	.4	.7	.3
Hate	2	2.5	1	Dresses & Frocks	3.3	5.6	2.2
Shoes (Pairs)	4	3.8	1.6	Coats	.5	.7	.5
Sleeping Apparel & Bathrobes	2.5	2.5	2				
Underwear	4	6.5	4				
Shirts	4.7	7	5				
Hosiery (Pairs)	10.5	14.5	9.6				
Knickers & Extra Pants	1.6	1.1	.5				
Overcoats & Topcoats	.5	.5	.3				
Suits	1	1.2	1				

Amounts shown in these two tables are in fractions because the needs of physical and mental workers were computed separately and the totals added and then divided by the total individuals of the given age groups.

annually in 1934 dollars. Yet, in 1929, only 12 per cent of the population had comparable incomes. Consequently 88 per cent received less than enough to assure them of reasonable comfort.

ANNUAL BUDGET FOR INDIVIDUALS

Babies under One Year		
	Male	Female
<u>Caps</u>	<u>1</u>	<u>1</u>
<u>Mittens (Pairs)</u>	<u>1</u>	<u>1</u>
<u>Cloaks</u>	<u>1</u>	<u>1</u>
<u>Sacques</u>	<u>2</u>	<u>2</u>
<u>Socks (Pairs)</u>	<u>2</u>	<u>2</u>
<u>Diapers</u>	<u>36</u>	<u>36</u>
<u>Slips</u>	<u>4</u>	<u>4</u>
<u>Skirts</u>	<u>3</u>	<u>3</u>
<u>Shirts</u>	<u>3</u>	<u>3</u>

Children One to Five		
	Male	Female
<u>Sweaters</u>	<u>2</u>	<u>2</u>
<u>Gloves & Mittens</u>	<u>2</u>	<u>2</u>
<u>Caps & Hats</u>	<u>2</u>	<u>2</u>
<u>Shoes (Pairs)</u>	<u>3</u>	<u>3</u>
<u>Hose (Pairs)</u>	<u>8</u>	<u>8</u>
<u>Sleeping Suits</u>	<u>2</u>	<u>2</u>
<u>Underwear</u>	<u>6</u>	<u>6</u>
<u>Dresses</u>		<u>6</u>
<u>Suits</u>	<u>6</u>	
<u>Coats</u>	<u>1</u>	<u>1</u>

Population from United States Department of
Commerce, Bureau of the Census.

This table and others following in this section are based chiefly on information furnished by Walter M. Polakov, consulting Engineer to National Survey of Potential Products capacity.

WEARING APPAREL BUDGET

MALE

Item	Men 15-64	Men 65 & Over	Boys 5-14	Total
Suits	3,913,470	243,140	1,001,976	5,158,586
Overcoats & Topcoats	1,573,065	81,047	500,988	2,155,100
Extra Pants & Knickers	3,529,800	121,571	1,623,201	5,274,572
Hosiery (Pairs)	45,657,253	2,327,190	10,500,708	58,485,151
Shirts	22,022,903	1,215,700	4,729,326	27,967,929
Underwear	20,438,221	972,560	4,007,904	25,468,685
Sleeping Apparel & Bathrobes	7,365,323	486,280	2,504,940	10,856,543
Hats	7,865,323	243,140	2,003,952	10,112,415
Shoes (Pairs)	11,817,175	399,443	4,007,904	16,224,522
Sweaters	1,573,065	121,571	1,001,976	2,696,612
Mackinaws	792,929			792,929
Overalls	4,757,576			4,757,576
Corduroys	2,378,788			2,378,788
Work Shirts	7,136,364			7,136,364
Collars	7,826,940	555,745		8,382,685
Gloves	3,529,800	156,303	1,001,976	4,688,079
Suspenders	1,573,065	121,571		1,694,636
Carters	3,146,129	243,140	1,001,976	4,391,245
Handkerchiefs	26,703,714	2,084,050	4,488,852	33,276,616
Ties	16,497,986	729,420	3,005,928	20,233,334
Work Gloves	4,757,576			4,757,576

WEARING APPAREL BUDGET

FEMALE

Item	Women 15-64	Women 65 & Over	Girls 5-14	Total
Coats	2,155,500	132,704	494,142	2,782,346
Dresses & Frocks	17,281,849	587,689	5,241,572	21,111,110
Suits	2,155,500	88,469	375,548	2,619,517
Hosiery (Pairs)	40,171,300	1,971,595	10,159,560	52,302,455
Underwear	25,293,397	1,023,724	6,483,144	32,800,265
Brassieres	4,635,151	265,406		4,900,557
Corsets, Cirdles, etc.	5,569,751	189,580		5,759,331
Sleeping Apparel, Kimonos & Bath- robes	9,270,300	530,812	2,114,928	11,916,040
Shoes (Pairs)	10,491,199	454,986	3,241,572	14,187,757
Hats	9,270,300	265,406	1,976,568	11,512,274
Sweaters	1,545,051	132,704	1,265,004	2,942,759
Gloves	10,491,199	644,565	1,620,786	12,756,550
Carters	6,180,200	530,812	1,976,568	8,687,580
Handkerchiefs	33,342,798	2,881,566	5,494,860	41,719,224

SOURCES AND METHODS

Statistical Family

The "private statistical family" in Pennsylvania is computed as 4.23 persons. It is the average number of individuals in private families, that is, excluding those in hospitals, institutions, etc. It includes one person "families" consisting of individuals living alone. The figure 4.23 is the United States Census Bureau average for the State. Divided into the total population, it gives the number of statistical families, 2,276,915. The age distribution, as shown in the United States Census for 1930, was used to calculate the budgets for food and wearing apparel.

Food

The food budget, in reference to quantity, was based upon Circular No. 296, United States Department of Agriculture, "Diets at Four Levels of Nutritive Content and Cost," by Hazel K. Stiebeling and Medora M. Ward. The "adequate" diet considered was neither a maximum nor a minimum but one which would furnish enough of the different nutritional elements to cover adequate requirements and provide a reasonable margin of safety. In making calculations 40 per cent of the adults were considered as active, requiring a higher diet. The basis of cost of diet was founded upon "Your Money and Your Meals" by Cove Hambridge.

Apparel

A budget furnished by Walter M. Polakov, consulting en-

gineer to the National Survey of Potential Products Capacity, was adopted and applied to the age groups of Pennsylvania as shown by the United States Census of 1930. Items which were not listed in the Polakov budget were allotted in much the same proportion as done by the Survey to coincide with its computations. The Pennsylvania Baby Book was used for the infants' wear budget.

Housing

In arriving at the replacement cost estimate, \$4000 was considered as the cost of construction of a housing unit and \$1000 the cost of the land upon which it stood. One bathroom was allowed for each statistical family of 4.23 persons.

Health

The figures on health personnel and medical facilities were taken from "The Cost of Medical Care," by I. S. Falk, C. Rufus Rorem and Martha D. Ring, and also from the American Medical Association Directory. The cost of medical care was taken from the quarterly bulletin (April, 1933) of the Milbank Memorial Fund and the Committee on the Cost of Medical Care. The 1929 figure was estimated upon the basis of per capita cost for the whole United States and adjusted for the difference of facilities of Pennsylvania and the average for the United States.

Recreation and Amusements

The cost was estimated upon the basis of the National Survey figure for 1929 and this figure was increased by 100 per cent to equal the human need budget.

Transportation

One automobile was given to each of the 2,276,915 statistical private families. This figure is not unduly high as is indicated by the fact that registration of passenger cars, not including buses, in Pennsylvania in 1929 was 1,515,875 or .67 car per each 4.23 persons. The cost of operation and maintenance of automobiles was estimated at 3.89 cents per mile per car travelling an average of 11,000 miles a year. The figures were obtained from the National Automobile Chamber of Commerce "Automobile Facts and Figures," for 1930. The garage estimate was reached by allotting \$5 per month per car. The automobile price is the average wholesale price of all cars in 1929. Since the cost of freight transportation is passed along to the consumer, and much the same is true of commercial passenger travel, both should be omitted from the budget to prevent duplication.

Income

The findings of the Brookings Institute in "America's Capacity to Consume," prepared by Maurice Leven, Harold G. Moulton and Clark Warburton, coupled with "Statistics of Income," published by the United States Department of Internal Revenue, furnished important sources of information upon incomes of individuals and families. See following section.

Capacity to Produce

The source for discussion of this subject was "America's Capacity to Produce," by E. G. Nourse & Associates

published by the Brookings Institute.

Adjustment of Income Dollars

In adjusting 1929 income dollars to the purchasing power of 1934, the index of cost of living for wage earners and low salaried workers in the United States, prepared by the United States Department of Labor, Bureau of Labor Statistics, and published in the Monthly Labor Review of August, 1934, was used.

Supporting the assertion in this section of the report that incomes are less adequate today than in 1929, are figures just released in a survey made by the Bureau of Business Research, University of Pittsburgh, which showed that 62 per cent of the families in Allegheny county in 1933 received less than \$1000. This statement was made on the basis of a house to house canvass of every ninth block.

Production Figures

Wherever used, were taken from the United States Census of Manufactures.

INCOME OF PENNSYLVANIANS

Pennsylvania, in 1929, had a spendable income of \$7,818,000,000 derived from wages, salaries, interest, dividends, rents, profits withdrawn from business, etc.* The services of housewives, the tasks persons perform for themselves and their families and various other things upon which no money value can be placed have not been included.

Because of the dearth of information regarding the income received by individuals in the State, except such as appear in income tax returns, all totals are necessarily estimates, and should be regarded at best as only close approximations. The incorporation of varying items by different students result in slight variations in the amounts of the total income.

Distribution of this income was such that three of every five families in the State had less than \$2,000 upon which to live in that year. And while the greatest concentration of these groups was between the \$1,000 and \$2,000 level, one in every five had an income of less than \$1,000.

The State had 2,089,612 families of more than one person at the end of 1929, according to estimates based upon the 1930 census, and 139,905 persons classified as families because of their occupancy of individual living quarters.

In addition, 497,954 income receiving individuals lived out-

* The imputed value of owned homes is included in this income figure but various items are excluded. For details as definition of income used and methods and sources of material, see appendix.

side family groups---in hotels, institutions, lodging houses and as roomers in private families. The number of income spending units was thus 2,727,471.

A great many families had more than one income recipient. As a matter of fact, 3,851,337 individuals received income and of these, 3,693,857 are estimated to have been gainfully employed.

The 2,089,612 families of two or more persons received an aggregate income of about \$6,597,000,000 or approximately \$3,157 per family. The average number of persons per family was just a fraction more than four. The 637,859 unattached individuals, including one-person families, received, in 1929, \$1,355,000,000 or about \$2,124 per capita.

The following facts will aid in showing the range and concentration of income.

Nearly 399,000 families, or slightly more than 19 per cent of the total, had incomes less than \$1,000.

About 1,300,000 families, or more than 62 per cent, had incomes less than \$2,000.

Nearly 1,670,000 families, or more than 79 per cent, had incomes less than \$3,000.

Slightly more than 1,846,000 families, or more than 88 per cent had incomes less than \$4,000.

Only a trifle more than 157,000 families, or 7.5 per cent, had incomes in excess of \$5,000.

About 47,400 families, or 2.3 per cent, had incomes in excess of \$10,000.

The 2.3 per cent last named received an aggregate of approximately \$2,000,000,000, or slightly more than the ag-

gregate of all those who received incomes less than \$2,000. On the other hand, the 19 per cent in the first group named received only 3.6 per cent of the total income.

At 1929 prices, a family income of \$2,000 may have been regarded, perhaps, as sufficient to supply only basic necessities. Yet more than 1,300,000 families, or 62 per cent of all those in the State, were below this standard of expenditure.

In connection with this analysis, attention should be called to the fact that in 1929 speculative profits from the sale of securities and other properties served to increase materially the amount of monetary income realized. Since those who had incomes in excess of \$4,000 formed the group most able to participate in speculative activities, the disparity in the incomes of the lower and higher income classifications was somewhat greater in that year than normally.

The distribution of income among unattached individuals and one-person families is similarly diverse and similarly concentrated.

While the focus of our attention is the family as the spending unit, the importance of the distribution of income among INDIVIDUAL recipients was not overlooked in the general analysis.

In compiling estimates of the division of income

among spending units study was made of the manner in which income is distributed among individual recipients. The accompanying tables which follow show the estimates in terms of simple distributions and the computation of the amount of income in each income class.

The estimates indicate that about 35 per cent of the income recipients, or close to 1,362,000 persons, received less than \$1,000 in 1929. The class between \$1,000 and \$2,000 comprised 47 per cent of the income recipients and somewhat less than 35 per cent of the aggregate income. Only 18 per cent of the income recipients had incomes exceeding \$2,000 and only 5 per cent acquired more than \$4,000.

Those having incomes greater than \$5,000 constituted about 3 per cent of the total number of income recipients and accounted for 36 per cent of the aggregate income. Those with incomes greater than \$10,000 comprised only 1.3 per cent of the total number but they controlled 27 per cent of the income.

Pennsylvania's Standing Among the States

The income of \$7,818,000,000 received by the people of Pennsylvania in 1929 placed this Commonwealth second among the states in total income received. New York was first with \$17,003,000,000. But while Pennsylvania ranked second in total income, it stood thirteenth in per capita totals for 1929, with \$815 going to each

individual. Individuals on farms fell far short of the income received by the non-farm population. The former received only \$305 per person while the latter acquired \$865.

Pennsylvania ranked twenty-fifth in the list of states in the per capita income of its farm population, with California taking first place with a per capita income of \$1246. In regard to the non-farm population, Pennsylvania ranked fifteenth, Delaware leading with a per capita income of \$1550.

Total income from non-farm occupations amounted to \$5,481,000,000. Approximately one-fifth of this sum represented returns from property and approximately one-ninth profits from the sale of property. In the first and third groups, Pennsylvania ranked second to New York. In the second, it was exceeded by New York and Illinois. This State ranked twentieth, twelfth and tenth respectively in per capita income from occupation, returns from property and profits from the sale of property, with New York again leading in all but the last named, in which class Delaware headed the list.

Did Pennsylvania become more prosperous between 1916 and 1929? Has our real per capita income been increasing over a period of years?

In making a study of income received by individuals,

consideration must be taken of the changes in the purchasing power of money and in the number of people who are to receive it. An increase in the total income from year to year may be apparent, rather than real.

The total income expressed in current dollars, has increased enormously, but changes in the per capita real income are not so discernible although it has increased.

In 1916 the spendable income of Pennsylvania in current money value amounted to about \$4,200,000,000 or \$504 per capita. In 1929 the total income amounted to about \$7,500,000,000 or \$793 per capita. The high point was reached in 1926 when the total income amounted to slightly more than \$7,700,000,000 with the per capita figure standing at \$833. These figures show an increase in total income of 80 per cent over a period of 14 years and an increase of 57 per cent for the amount per capita.

When the above totals are expressed in terms of constant money value, that is corrected for changes in the purchasing power of money, the increase in total income amounted to only 23 per cent for the 14 year period. With the per capita income increasing only 8 per cent with 1926 still the high year.

COMPARISON OF PENNSYLVANIA'S INCOME WITH THAT OF
OTHER STATES BY CLASSIFICATION FOR 1929

Income Classification	Amount (Millions of dollars)	Rank of Pennsylvania	Top State	
			State	Amount (Millions of dollars)
Income of the Entire Population	(a) 7.818	2	N.Y.	17,003
Income of the Non-Farm Population	(a) 7,558	2	N.Y.	16,652
Income of the Farm Population	(a) 260 (b)	8	Cal.	714
Per Capita Personal Income of the Entire Population	(a) 815*	13	N.Y.	1,365*
Per Capita Personal Income Non-Farm Population	(a) 865*	15	Del.	1,550*
Per Capita Personal Income Farm Population	(a) 305* (b)	25	Cal.	1,246*

* Expressed in dollars

- (a) Includes income from profits from the sale of property and imputed rent on owned homes. Excludes income from durable consumption goods other than homes.
(b) Includes incomes from non-agricultural sources.

Source: America's Capacity to Consume -- The Brooking's Institution -- pp. 172-173

COMPARISON OF PENNSYLVANIA'S NON-FARM INCOME
WITH THAT OF OTHER STATES BY SOURCES FOR 1929

Income Classification	Amount (Millions of dollars)	Rank of Pennsylvania	Top State	
			State	Amount (Millions of dollars)
Income from Occupation Non-Farm Population	(a) 5,481	2	N.Y.	9,906
Returns from Property	" " (b) 1,474	3	N.Y.	4,792
Profits from sale of property	" " " 603	2	N.Y.	1,954
Per Capita Income from occupation	" " " (a) 627*	20	N.Y.	843*
Per Capita Income Re- turns from property	" " " (b) 160*	12	N.Y.	402*
Per Capita Income Pro- fits from sale of property	" " " " 69*	10	Del.	529*

* Expressed in dollars.

(a) Wages, salaries, and business profits in regular occupations. Does not include income from odd jobs of otherwise employed persons or income from roomers or boarders in private families.

(b) Chiefly investment income, including imputed rent on owned homes, also includes income from odd jobs of otherwise employed individuals, from roomers and boarders in private families, and from gardens, cows, chickens, etc. Does not include imputed income from durable consumption goods other than homes.

Source: America's Capacity To Consume --The Brookings' Institution -- pp. 175-176.

ESTIMATED INCOME OF FAMILIES AND UNATTACHED INDIVIDUALS
BY INCOME CLASSES - PENNSYLVANIA - 1929
(In millions of dollars)

Income classes* (In dollars)	Total income of all spending units		Total income of families of two or more persons		Total income of Unattached Individuals (Including one-person families)	
		Per Cent		Per Cent		Per Cent
0 to 1,000	418	5.257	241	3.662	177	13.051
1,000 to 2,000	1,984	24.949	1,531	23.201	453	33.403
2,000 to 3,000	1,185	14.902	1,025	15.534	160	11.843
3,000 to 4,000	776	9.759	705	10.691	71	5.206
4,000 to 5,000	216	2.716	198	3.	18	1.350
5,000 to 10,000	944	11.871	846	12.826	98	7.226
10,000 and over	2,429	30.546	2,051	31.086	378	27.921
All classes	7,952	100.	6,597	100.	1,355	100.

* Includes income from occupation, investments and sale of property; also includes imputed income on owned homes, but does not include imputed income on durable consumption goods other than homes.

ESTIMATED NUMBER OF FAMILIES AND UNATTACHED INDIVIDUALS
BY INCOME CLASSES -- PENNSYLVANIA -- 1929

Income Class* (In dollars)	Total number of spending units	Per Cent	Number of Families of two or more persons	Per Cent	Number of Unattached Individuals (Including one-person families)	Per Cent
0 to 1,000	661,119	24.239	398,238	19.058	262,891	41.213
1,000 to 2,000	1,175,957	43.115	904,530	43.287	271,427	42.553
2,000 to 3,000	424,573	15.567	366,706	17.549	57,867	9.072
3,000 to 4,000	194,378	7.127	176,907	8.466	17,471	2.739
4,000 to 5,000	93,646	3.433	85,883	4.110	7,763	1.217
5,000 to 10,000	122,053	4.475	109,851	5.257	12,202	1.913
10,000 and over	55,745	2.044	47,497	2.273	8,248	1.293
All classes	2,727,471	100.000	2,089,612	100.000	637,859	100.000

* Includes income from occupation, investments, and sale of property; also includes imputed income on owned homes, but does not include imputed income on durable consumption goods other than homes.

ESTIMATED DISTRIBUTION OF ALL PERSONAL INCOMES
IN PENNSYLVANIA 1929 (a)

Income Class ^(a) (In dollars)	Number of Persons in Each Class	Per Cent	Amount of income (Millions of dollars)	Per Cent
0 to 1,000	1,361,609	35.3542	928	11.6752
1,000 to 2,000	1,798,998	46.7110	2,744	34.5094
2,000 to 3,000	390,795	10.1470	991	12.4620
3,000 to 4,000	117,670	3.0553	434	5.4575
4,000 to 5,000	52,317	1.3584	112	1.4119
5,000 to 10,000	79,095	2.0537	578	7.2619
10,000 and over	50,853	1.3204	2,165	27.2221
All classes	3,851,337	100.0000	7,952	100.0000.

(a) Includes income from occupation, investments, and sale of property. Also includes imputed income on owned homes, but does not include imputed income on durable consumption goods other than homes.

PENNSYLVANIA'S INCOME*

1916-1929

Year	<u>Current Money Values</u>		<u>In Constant Values (1913 Prices)</u>	
	<u>Income</u> (In millions of dollars)	<u>Per Capita</u> (In dollars)	<u>Income</u> (In millions of dollars)	<u>Per Capita</u> (In dollars)
1916	4,207	504	3,856	432
1917	4,868	573	3,785	448
1918	6,347	742	4,181	489
1919	5,747	663	3,271	377
1920	6,435	734	3,250	371
1921	5,865	662	3,464	391
1922	5,349	654	3,695	413
1923	7,028	773	4,398	487
1924	7,241	794	4,520	496
1925	7,190	781	4,352	473
1926	7,748	833	4,662	501
1927	7,487	798	4,510	480
1928	7,184	758	4,437	474
1929	7,583	793	4,754	497

* Excludes profits from the sale of property, and the imputed value of durable consumption goods other than homes.

SOURCES AND METHODS

Definitions

While in the mind of the average person the work "income" is associated only as revenue in terms of money, it is, fundamentally, the flow of goods and services over a given period of time. "Income received" or the amount available for spending purposes by the people of the Commonwealth consists in the main of the amounts received by individuals in the form of wages, salaries, pensions, compensations for injuries, annuities, interest, dividends, rents, royalties, profits withdrawn from business, profits from the sale of properties and the imputed value of owned homes. The person residing in a dwelling owned by himself receives an income from it just as truly as if he were paid rent by someone else. He is receiving use of the structure in return for the investment he made in it. The net value of the services rendered by other durable consumers goods, such as landed estates, automobiles and the like, can, at best, be approximated only roughly and for that reason they have been excluded from all estimates herein. In addition to the exclusion of the value of the services persons perform for themselves and their families (as in the case of housewives) important things excluded from the totals presented are expense allowances to employees, earnings from "odd jobs" and charity.

Sources

Wherever possible the State figures in "America's Capacity to Consume" published by the Brookings Institution have been used. Statistics of Income of the Bureau of Internal Revenue 1916-1929 and the study by the Department of Commerce report, 73rd. Congress, "National Income, 1929 to 1932" Senate Document 124, were utilized.

The method employed throughout the study was similar to that used by the Brookings Institution in arriving at the estimate for the United States.

The estimates for incomes in the various years between 1916 and 1929 were obtained by applying to the other years in the series the proportions of Pennsylvania's income to National income for the years 1919, 1920 and 1921, prepared by Maurice Leven in his work "Income in the Various States" (National Bureau of Economic Research), necessary corrections were made.

The distribution of income classes was obtained by applying the proportion in these groups in the United States as shown by the "Statistics of Income" to the figures shown by the Brookings Institution study.

Four out of ten of Pennsylvania's inhabitants are workers --if they can find work. Altogether, they number between 3,500,000 and 4,000,000. Of vital importance to them are the conditions under which they spend the working part of their waking hours; nothing is more important to them or to their families than the monetary return received for their labor. Upon their earnings depend the livelihood, health and recreation of themselves and their families.

Approximately nine out of every ten of these workers are persons employed by others who direct their labor and determine the wage or salary that they shall receive for the work performed.

The balancing of work and pay involves many problems. On one side of the ledger is what the worker will give for his hire, what hours he shall labor and at what physical risk. There also is the question of whether children shall be employed. On the other side there is the question of how much pay the worker shall receive and whether he shall organize to bargain with his employer and whether he shall be assured of work and compensation when he merits them.

The Jobs

The question as to whether there is a job for every worker

* Prepared by Elizabeth S. Johnson, Department of Labor and Industry.

was one of increasing insistence even through the past decade when the State considered itself prosperous. More jobs are demanded and will be demanded by our increasing proportion of job seekers in the population. The problem is to find those jobs.

The manufacturing industries of Pennsylvania barely kept a constant number of wage earners during the 15-year period ending in the peak year of 1929, despite the increasing population of the State. In fact, in 1931 fewer wage earners were employed in Pennsylvania manufacturing industries than at any time for which the Census of Manufactures was taken since 1904. From 1929 to 1931, the number of wage earners in manufacturing industries dropped from slightly more than 1,000,000 to 775,000, a decline of nearly 25 per cent which occurred before the depression had spent its force in disrupting economic life in the State.*

Whether resulting in part from the rapid shift in the capacity of mechanical industry to use the labor of men and women or merely coincident with it, the depression forced more than 1,000,000 Pennsylvania workers into the ranks of the unemployed.

At the beginning of 1932, when statistics of unemployment were first prepared by this State, the number out of work was approximately 1,000,000. The total mounted to one and one-

* See sections on Manufacturing Industries.

third million by the spring of 1933. In spite of the drive for re-employment under the NRA in September, 1934, the total number of Pennsylvania workers out of jobs or temporarily on government of relief work, was within a few thousand of the million mark.

Problem of Reabsorbing Unemployed

In the light of a statement by Dr. Isador Lubin, United States Commissioner of Labor Statistics, in May 1934, Pennsylvania's problem of reabsorbing the unemployed into gainful occupations presents a serious challenge. Assuming the situation in this State parallels that of the nation, only about 350,000 of the State's jobless may be expected to be reabsorbed into the manufacturing, mining, communication and transportation industries and in retail and wholesale trade in the State if industrial activity returns to the level of 1929. A return to the 1929 levels of employment in the fields of agriculture and domestic service cannot logically be expected, and a return in building construction can be expected only if extensive government-financed housing projects are carried out.

"The only one of these fields in which we can logically look for an expansion in employment is in the professions," Dr. Lubin said. "The lack of adequate health, educational and recreational facilities is a crying need in the United States. Here again, however, expansion cannot be expected without greatly increased expenditures on the part of government. These

services do not lend themselves to the regime of private profit. Assuming that American industry as a whole will revive to the point where it employs as large a number as in 1929, and despite increases in efficiency I see no reason to believe that this is outside the realm of probability, provision will have to be made in the field of social services for the employment of something approaching three million* additional workers. A beginning has already been made in the Civilian Conservation Corps. Continually increasing income will have to be taken from the profits of industry and through inheritance taxes for employment in fields where we are today greatly undermanned. With a modernized system of education and with recreation facilities adequate to our needs, and with a public health system which will maintain the American people in a condition in keeping with modern scientific knowledge, there will be no difficulty in reabsorbing those who cannot during this generation find employment in private industry."

In the following pages are traced some trends in working conditions, accidents, child labor, hours, earnings and labor organization through the decade of the 1920's up to the present. The significance of the NRA, particularly its application of the minimum wage principle and its assertion of the right of collective bargaining, in serving as pegs for labor

* Equivalent to 250,000 for Pennsylvania

standards is notable. Measures which challenge the State to use its intelligence to develop constructive control over working conditions without shifting the entire responsibility to the Federal government are indicated.

Accidents

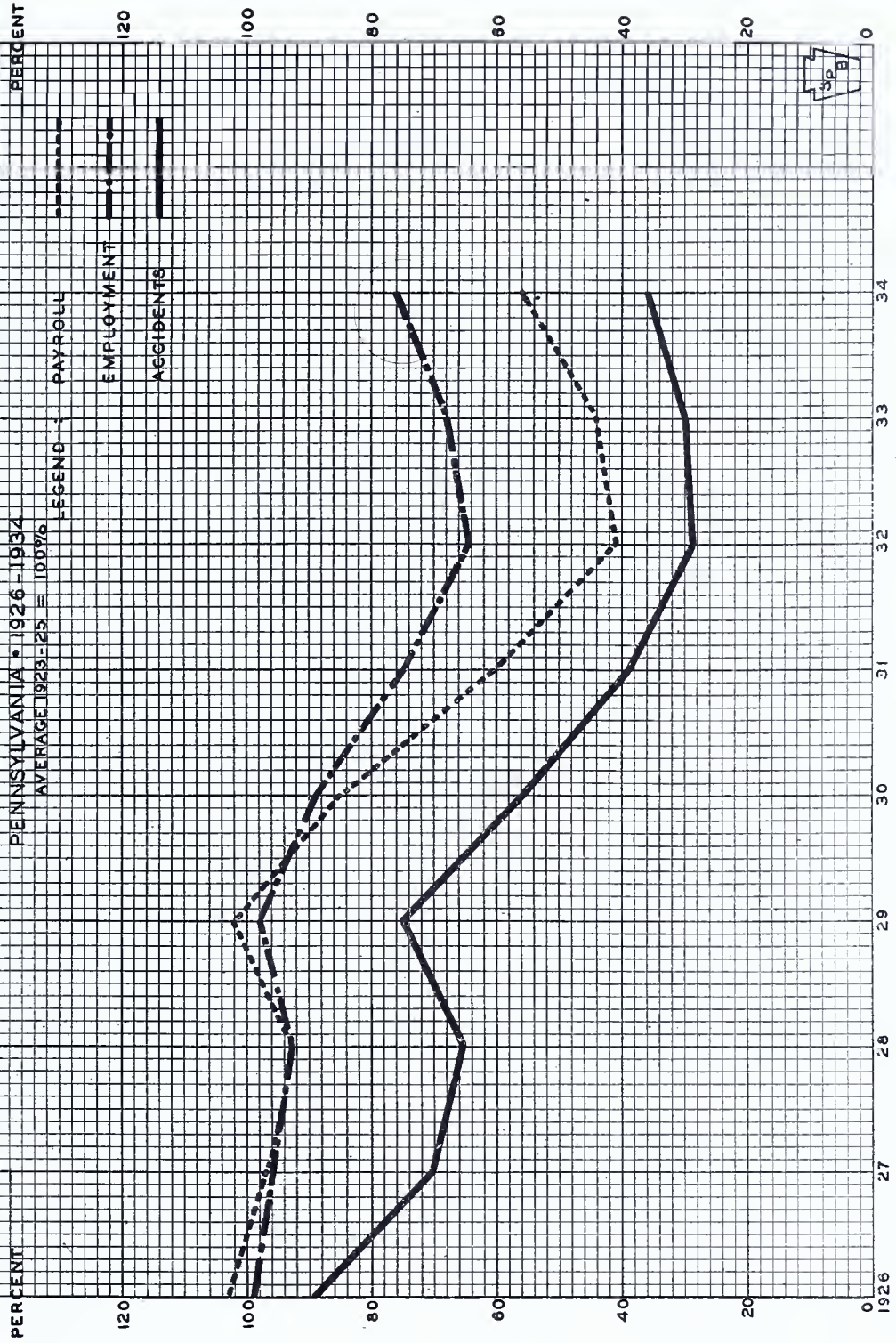
Employment in modern industry has not been and is not safe. The risk of accident for manufacturing workers has been but slightly reduced during the past decade and a half, despite aggressive safety campaigns and the incentive for safety brought by the Workmen's Compensation Act. An accompanying chart shows that the trend of accidents has followed quite closely the trend in employment and payroll totals.

Approximately 170,000 accidents to employes were reported in 1929 to the Pennsylvania Department of Labor and Industry, 3,600 of them resulting in permanent disability, and 1,800 resulting in death.

The most hazardous industry in the State, anthracite mining, has, on the other hand, become increasingly hazardous in the last ten years. This is shown in the second accompanying chart. The ground lost in safety for anthracite miners dates chiefly from the beginning of the depression, and probably may be explained by the greater mechanization of the industry and the attempted economy in equipment, maintenance and supervision in a depressed industry.

The safety work of the Department of Labor and Industry and the Department of Mines needs to be reinforced and legis-

TRENDS IN ACCIDENTS EMPLOYMENT & PAYROLL IN MFG.



TRENDS IN ACCIDENTS EMPLOYMENT & WAGE PAYMENTS



lation for additional safeguarding for mine workers should be given thorough consideration.*

The values and limitations of the present workmens' compensation system -- the meager benefits, defects in administrative provisions and the need for providing compensation for workers incurring occupational diseases --- are discussed under the heading "Workmens' Compensation" in the Social Security section.

Child Labor

In no one aspect of working conditions has so rapid and spectacular achievement been made as in the field of child labor. The question now before Pennsylvania is not so much of a choice of eliminating child labor as it is a matter of holding gains already made under the NRA and patching up a few leaks.

A consistent decline in the number of 14- and 15-year old children out of school and working for their living, is shown in the appended table. From 25,000 children at work during the period from 1925 to 1927, the number dropped with the depression to 7,000 in 1932, and approached the vanishing point in 1934 when only 216 children were at work on general employment certificates at the close of the first

* See discussion of Workmen's Compensation Act in Social Securities Section.

school year after the enactment of the NRA. These figures for general employment certificates exclude children at domestic service and farm work who are not touched by the NRA and it also excludes children at work outside of school hours.

CHILDREN 14 AND 15 YEARS OF AGE AT WORK ON
GENERAL EMPLOYMENT CERTIFICATES* AT CLOSE
OF SCHOOL YEAR

School Year	Number of Children
1923-24	18,656
1924-25	25,045**
1925-26	25,947
1926-27	26,015
1927-28	23,335
1928-29	16,648
1929-30	21,593
1930-31	13,310
1931-32	7,025
1932-33	4,702
1933-34	216

Source: School Census, Pennsylvania Department of Public Instruction.

An additional 1000 children were certificated at sometime during the school year ending in 1934 for employment outside of school hours. This is the lowest number certified for vacation work for any year on record, and is half of the number for the preceding year. The number of permits for children 14 and 15 years of age to leave school for domestic service or farm work, occupations not covered by the Child Labor Law and not requiring employment certificates, likewise have been materially re-

* Excludes domestic service, farm work, and employment only outside of school hours.

** For three quarters ending March, 1925. Data for last quarter not available.

duced during the last few years. Twenty-five hundred children were excused from school attendance for these occupations in 1934, compared to 6,500 so excused in the peak year of 1928.

These achievements in reducing the number of child workers were not the only depression effects on child labor. The number of children (7,000) employed on general employment certificates at the end of the school year in 1932 fails to reveal the really significant thing that had been happening: that certain industries were using children as cheap and defenseless labor to reduce labor costs. In some sections of Pennsylvania, shirt factories depended on the labor of children, many under 16 years of age and others under 18, to the extent of half their work force. Wages to those under 16 were approximately \$3 a week and often less. Child labor tended to be driven to this and other fields such as domestic service and street trading where conditions were poorest and least supervised.

With the whole-hearted acceptance of the NRA prohibitions of the labor of children under 16 years of age, the immediate effectiveness of this provision was remarkable. In the cotton garment industry, one of the largest child-employing industries during the depression, one out of every 25 workers was a child under 16 years of age in October, 1932, while in February, 1934, only two minors under 16 were found in a study of 12,000

workers in this industry.*

Child labor thus has been recognized as a wholly incongruous thing when the supply of adult labor far exceeded the available jobs. Were Federal regulation removed, the return of child labor would be an untenably backward step. State legislation prohibiting the employment of children under 16 years of age and regulating the employment of those under 18 is needed. This regulation to extend to children at farm work and domestic service as well as to secure the gains already made under the NRA.

Hours of Work

The hours of work which an employee has been asked to devote to his job in return for the wage he has received showed a slow though decidedly downward trend during the two decades preceding the NRA. Not until the situation of unregulated hours--some employes working 70 hours a week while others worked seven, and a million working none at all--was checked by the NRA, did any appreciable reduction come in the standard length of the work week in Pennsylvania.

The year 1913 marked the passage of the present 54-hour a week law for women, superseding a 60-hour a week law. Fifty-four hours was the prevailing length of the work week according to the 1914 United States Census of Manufactures, both

* Cotton garment Workers in Pennsylvania under the NRA, Bureau of Women and Children, Pennsylvania Department of Labor and Industry, Monthly Bulletin September, 1934.

in Pennsylvania and in the United States as a whole. In the 15-year period between 1914 and 1929 the standard work week was reduced in Pennsylvania by four hours, from a median average of 54 hours to one of 50 hours a week.* Pennsylvania moved more slowly toward shorter hours than the United States as a whole. The median average in 1929 for the United States was 49 hours, five hours less per week than in 1914. The proportion of employes with a 48-hour or shorter standard week was correspondingly smaller for Pennsylvania in 1929; only 37 per cent of the wage earners in manufacturing working these shorter hours in this Commonwealth while the nation as a whole showed 46 per cent.

No figures on the average length of the standard work week can convey a real picture of actual conditions since workers have had greatly varied working hours in different industries, in various establishments in one industry and among individual workers in a single establishment.

Among a group of 16,000 silk workers in Pennsylvania whose hours were studied in 1928,** just one-third were actually working the scheduled number of hours established in the various plants as the length of the working week. One-third of the workers put in overtime hours, and despite the fact that it was a busy season another one-third of the employes

* United States Census of Manufactures, 1914, 1929.

** Bureau of Women and Children, Pennsylvania Department of Labor and Industry, Hours and Earnings of Men and Women in the Silk Industry, Special Bulletin No. 29, 1929.

worked less than the regular weekly schedule. This irregularity in weekly hours means added exertion and fatigue in the case of overtime; in the case of under time, it means a pay envelope thinner than the worker has anticipated.

The economic depression has affected the length of the work week in ways other than bringing an increase in part-time work. While some employes worked all too short hours, others worked longer hours than in periods of normal business activity. On the one hand, the average number of hours actually worked by employes in Pennsylvania manufacturing industries; in contrast to scheduled full time, fell from an average of 49 a week in 1929 to an average of 32 a week in 1932.

AVERAGE NUMBER OF HOURS ACTUALLY WORKED PER WEEK
IN PENNSYLVANIA MANUFACTURING INDUSTRIES
1927-1934

Year	Actual Weekly Hours (Average)
1927	46.6
1928	46.9
1929	48.8
1930	44.5
1931	38.2
1932	31.9
1933	33.1
1934 (1st 10 months)	32.3

Source: Pennsylvania Department of Labor and Industry in co-operation with Federal Reserve Bank of Philadelphia.

On the other hand, additional figures from the Pennsylvania Department of Labor and Industry bear out the increasing prevalence of very long hours of work. A study of the silk in-

dustry in 1932 revealed a marked increase in the proportion of workers employed for approximately the 54-hour week maximum permitted under the Woman's Law. Twenty-five per cent of the women worked 53 or more hours a week in October, 1932, compared to the 16 per cent who worked such long hours in September, 1928, one of the busiest months in the record of the industry during the period preceding the depression.* In 1932, five per cent of the men silk employes worked 70 hours or longer in one week.

A further indication of the breakdown of hour standards under the force of the job competition from the unemployed during the depression is revealed in the record of prosecutions for violation of the Woman's Law. Between 1927 and 1933 such prosecutions had multiplied nearly tenfold, from 55 to 422 a year.** This same proportion of increase in violations of the Woman's Law was shown among silk workers whose hours of work in 1928 and 1932 were referred to above. Although in certain instances the workers readily accepted these excessive hours because of their urgent need for the increased earnings, they probably endured the long hours more frequently because they feared they would lose their jobs if they did not work the time their employers requested. The employers, on the other hand, often required excessive hours of work only because of the pressure

* Bureau of Women and Children, Pennsylvania Department of Labor and Industry, Hours and Earnings in the Textile and Clothing Industries of Pennsylvania, October, 1932.

** Pennsylvania Labor and Industry in the Depression, Pennsylvania Department of Labor and Industry, Special Bulletin No. 39.

for lower overhead costs or because of rush orders which sharply competitive conditions had brought.

Second only to the reduction in child labor is the reduction in the hour standards the NRA brought within a few months. After 15 years, during which four hours were subtracted from the standard work week in Pennsylvania, the NRA produced almost overnight a 10-hour decrease in the standard work week for the mass of the manufacturing industries of the State. Manufacturing industry's general acceptance of the 40-hour week as standard, however, has not eliminated the problem of irregularity in the number of working hours with its attendant irregularity in weekly earnings. A study of the cotton garment industry in Pennsylvania in February, 1934, showed that only one-fourth of the employes worked exactly 40 hours, the NRA maximum; 71 per cent were recorded as working fewer hours.* A third of the total group were reported as working even less than 30 hours a week in a period of average activity.

The gains of the NRA in shortening hours have been confined largely to the manufacturing industries. Hour standards in the service industries have for the most part been set by NRA codes at 48 and 54 hours a week, and actual hours of work are longer than for manufacturing industries and for mining.

* Cotton Garment Workers under the NRA, Bureau of Women and Children, Pennsylvania Department of Labor and Industry, Quarterly Bulletin, September, 1934.

AVERAGE ACTUAL WEEKLY HOURS IN NON-MANUFACTURING
INDUSTRIES IN PENNSYLVANIA

Average for the first 10 months of 1934

Industry	Average actual weekly hours
----------	-----------------------------

Longer than for manufacturing industries

Hotels	47.5
Street railways, bus and taxi	44.1
Wholesale trade	41.3
Dyeing and cleaning	41.1
Laundries	40.0
Light, heat and power	39.6
Retail trade	38.6
Telephone, telegraph and broadcasting	37.3
Crude petroleum	34.8
Quarrying and non-metallic mining	32.4

Manufacturing industries	32.3
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Shorter than manufacturing industries

Anthracite	32.0
Bituminous	25.6

Source: Pennsylvania Department of Labor and Industry in cooperation with the Federal Reserve Bank of Philadelphia and the United States Bureau of Labor Statistics.

Earnings

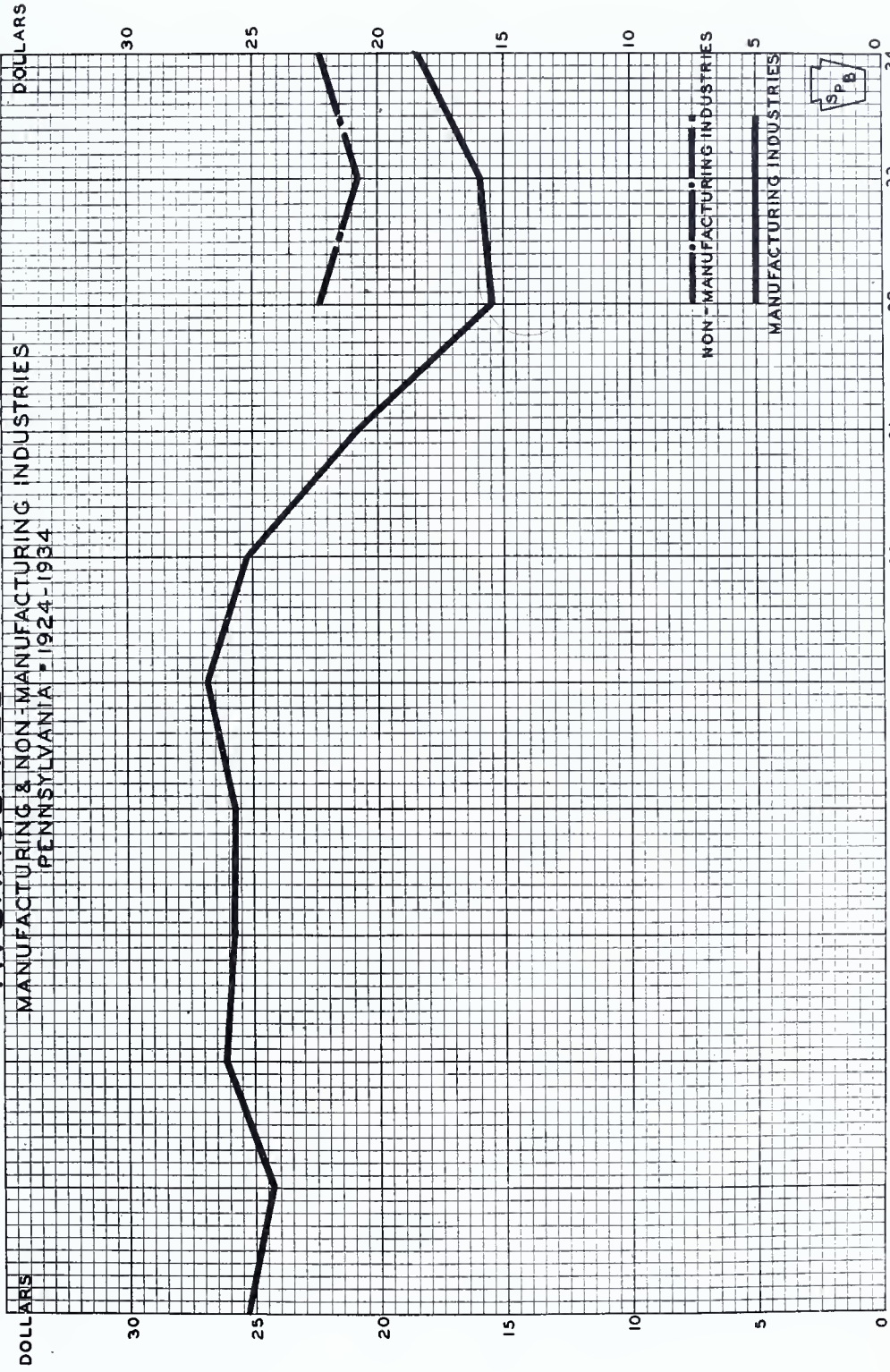
Work done, measured chiefly by hours on the job, appears on the outgoing side of the worker's ledger. Earnings appear on the incoming side.

Information on the earnings trend in Pennsylvania is available since 1923 for wage earners in manufacturing industries. An accompanying chart shows a fairly even trend in the amount of average weekly earnings up to 1928, with a slight increase in 1929, just prior to the depression slump. The average weekly earnings in this period of prosperity varied around \$26 a week for Pennsylvania. The collapse in earnings, beginning in 1930 and continuing until the middle of 1933, resulted in a net drop of almost 50 per cent. In March, 1933, the average earnings were \$13.70 a week. In terms of living costs this decrease was approximately 33 per cent since March 1929. The rise in average earnings, accompanying the NRA and the New Deal program, has resulted in an increase to about \$18.50 a week, the average for 1934. In terms of living costs in Pennsylvania average weekly earnings of those employed in manufacturing industries in 1934 were approximately 15 per cent below the 1929 level.

In the basic metal manufacturing industries of the state earnings have fluctuated more than in the textile and clothing industries. From March, 1929, to March, 1933, the drop in average weekly earnings was 60 per cent for metal industry employees compared to 46 per cent for textile and clothing workers.

AVERAGE WEEKLY EARNINGS

MANUFACTURING & NON-MANUFACTURING INDUSTRIES
PENNSYLVANIA - 1924-1934



The rally from the low point of March, 1933, when earnings for each industry group averaged little more than \$12 a week, brought average earnings in the metal industry to \$18.50 a week and in the textile and clothing industries to \$16.60 a week in March, 1934.

Information on average weekly earnings in non-manufacturing industries is available for Pennsylvania beginning with 1932, with an average of \$22.43 a week. Workers in these industries have lost 1 per cent in terms of living costs between 1932 and 1934.*

These average figures for all non-manufacturing industries conceal a wide variation in earnings of workers in the different industries of the State. In insurance and real estate establishments average weekly earnings were \$33 a week in 1934, while in hotels employes averaged little over \$13 a week and hired farm labor averaged \$1.76 a day, without board.

The effect of the depression and the recovery period on earnings of workers in Pennsylvania is, however, not fully told in terms of averages. In October, 1932, 15 per cent of the men and 24 per cent of the women in the silk industry earned less than \$10 a week, compared to but 2 per cent of the men and 5 per cent of the women whose earnings fell in this classification in

* Index of Cost of Living in Pennsylvania. (Compiled from United States Bureau of Labor Statistics figures for Philadelphia, Pittsburgh and Scranton) December 1917=100

June 1926-122.3	June 1932-96.7
June 1929-121.4	June 1933-90.7
June 1930-118.4	June 1934-97.5
June 1931-108.3	

AVERAGE WEEKLY EARNINGS OF EMPLOYEES IN NON-
MANUFACTURING INDUSTRIES, 1934

Industry	Average weekly earnings (first 10 months of 1934)
----------	--

Higher average weekly earnings than in manufacturing industries

Insurance and real estate	\$33.13
Light, heat and power	29.90
Banking and brokerage	29.64
Steam railways (class 1)	28.82*

Anthracite mining	\$27.57
Telephone, telegraph, & broadcasting	27.27
Wholesale trade	27.01
Street railways, bus and taxi	24.65
Crude petroleum producing	23.63
Retail trade	19.73
Construction and contracting	19.71

Average weekly earnings of manufacturing industries	18.53
---	-------

Lower average weekly earnings than in manufacturing industries

Dyeing and cleaning	\$18.52
Bituminous coal mining	17.72
Quarrying and non-metallic mining	16.46
Laundries	15.43
Motor-freight, docks and warehouses	15.02
Hotels	13.11**
Farm labor (6-day week basis)	10.56

* Figure for United States for first seven months, 1934, from Interstate Commerce Commission.

** Excludes value of room, board and tips received by some employees in the industry.

Source: Pennsylvania Department of Labor and Industry in co-operation with the Federal Reserve Bank of Philadelphia and the United States Bureau of Labor Statistics, except for farm labor. The figure for farm labor is six times the average daily wage for employment without board (\$1.76) as reported by the United States Department of Agriculture.

February, 1928, for full time work.* While the silk workers suffered greatly in reduced earnings, with a drop of approximately 35 per cent in the median weekly earnings for full time work for both men and women over this four-year period, exceedingly low wages were more prevalent in the garment factories of the State. The \$7.50 median average weekly earnings of workers in this industry in October, 1932, were approximately half the average weekly earnings of workers in all manufacturing industries at this period of the depression. In this industry, where the employes were chiefly women, wages had fallen to so low a level that one-fourth of all workers earned less than \$5 a week in October, 1932, and only 10 per cent earned as much as \$15. An investigation of wages in establishments on which testimony was given at hearings held by the Joint Legislative Committee to investigate women's wages and child labor in the Commonwealth showed that in May, 1933, half of the 5000 women workers in 61 establishments covering a large variety of industries besides clothing earned \$8.75 a week or less.

The application of the minimum wage principle under the NRA in Pennsylvania has had unquestionably a very great influence in the upward movement of earnings in manufacturing industries during the last year and a half. An accompanying chart shows that Pennsylvania not only has gained in the amount of average weekly earnings, but has gained proportionately more than other

* Bureau of Women and Children, Pennsylvania Department of Labor and Industry, Hours and Earnings of Men and Women in the Silk Industry, 1929, Special Bulletin No. 29. Hours and Earnings in the Textile and Clothing Industries of Pennsylvania October, 1932.

States in the northeastern section of the United States. Before the upturn of 1933, the average weekly earnings in Pennsylvania were lowest among the 15 states east of the Mississippi River and North of the Mason-Dixon line, its industrially competitive area.* Pennsylvania's relative position for the first nine months of 1934 is fourth from the bottom. This improvement in Pennsylvania has coincided with an increase of a half-hour in average number of hours actually worked per week. The increase in earnings since the NRA has raised average weekly earnings in Pennsylvania to 80 per cent of the figure for the state with the highest weekly earnings in 1934, while in 1932 average weekly earnings in manufacturing in Pennsylvania were only 68 per cent of those reported for the highest ranking state.

As Pennsylvania, a low earnings state, has increased in average weekly earnings in its manufacturing industries under the influence of minimum wage regulation, so the lower-paid workers within the State seem to be gaining more than the higher-paid workers. An illustration of the distribution of earnings among the workers in a given industry is available from studies

* Northeastern industrial states included in this statement and in Chart are:

Connecticut	Massachusetts	Ohio
Delaware	Michigan	Pennsylvania
Illinois	New Hampshire	Rhode Island
Indiana	New Jersey	Vermont
Maine	New York	Wisconsin

From computations based on employment and payroll data published by the United States Bureau of Labor Statistics and on data from the Pennsylvania Department of Labor and Industry.

AVERAGE WEEKLY EARNINGS IN MANUFACTURING INDUSTRIES



FIGURE NO. 76

PENNA. DEPARTMENT OF LABOR & INDUSTRY.

made in 1932 and 1934 for the cotton garment industry in Pennsylvania.*

The NRA established a minimum wage of \$13 for this industry and the earnings of individual workers grouped sharply at the \$13 point in February, 1934. Previously in 1932, a wide range in earnings with no sharp grouping at one point existed, but with 35 per cent earning less than \$13 a week. Half of the workers in February, 1934, received no more than the minimum wage for the hours worked, even though this is an industry where piece work payment prevails.

The proportion of workers receiving earnings above \$13 was increased in 1934 over that for 1932, although the proportion of workers in the higher-paid categories was not large. Earnings of \$15 a week or more were found for only 15 per cent of the total working force in February, 1934. In October, 1932, 10 per cent earned \$15 or more a week. The minimum wage principle, while dramatically aiding the majority of the workers in this low-wage industry thus has failed to produce corresponding increases for the more highly paid groups. There is great need for more analysis of the results of the present NRA minimum wage regulations to show the effect upon the earnings on the more highly paid workers.

The effectiveness of the NRA minimum wage provisions de-

* Cotton Garment Workers under the NRA, Bureau of Women and Children, Pennsylvania Department of Labor and Industry. Quarterly Bulletin, September, 1934.

pendes greatly on the efficiency and thoroughness of their enforcement machinery. Two regional offices of the NRA, charged with labor compliance have been established in Pennsylvania, one in Philadelphia and one in Pittsburgh, except as other provision for compliance with code labor provisions is made for specific industries. These offices handle only cases of complaints; they do not assume responsibility for discovering code violations where specific complaints have not been filed. This situation is in contrast to the policy of complete coverage followed in the enforcement of State labor laws.

The limitations of the NRA method of enforcement are indicated by the findings of the study of cotton garment workers, that at least 12 per cent of the employes were being paid less than the wage required by the code, and that the majority of the plants were involved in these violations.

The activities of the two NRA compliance offices in Pennsylvania during the first 10 months of 1934 have, however, resulted in some real accomplishment. Within that period, they have collected more than \$200,000 in back wages for workers who had been paid less than the required minimum wage.

While wage earners were experiencing moderate gains in earnings during the first year of the NRA, 250 corporations in the United States, having a net worth of approximately \$10,000,000,000 enjoyed far greater benefits. As reported by the National City Bank Bulletin for August, 1934, the net

profits of these corporations increased \$190,000,000 or 220 per cent--from \$86,000,000 for the first half of 1933 to \$276,000,000 for the corresponding period of 1934.

The future trend of workers' earnings in Pennsylvania is hardly predictable. Much depends on whether the minimum wage principle is continued to offset the downward pull on wages exerted by a great number of unemployed workers seeking jobs.

The future of workers' earnings in Pennsylvania depends indeed not only upon the continuation of the minimum wage principle through state legislation and the required payment of wages earned, but also upon the power of organized labor to bargain for higher wage standards. This bargaining power will determine the figure at which minimum wage rates may be set and also will determine to what extent Pennsylvania workers will be employed under agreements, guaranteeing certain wage standards, that have been made between organized employers and employees outside the authority of governmental regulations.

Labor Relations

Planning for progressive improvement in the working conditions and in the income of wage earners is crucial in any planning for the welfare of the citizenry of Pennsylvania. The underlying forces for such improvement are not only the increase in the productive capacities and wealth of the State but also the power of workers to secure for themselves a fair share of the product. Such power can be exerted effectively

only through organizations by which they can voice their claims and bargain for what they shall receive.

The organization of workers into unions went through various vicissitudes during the 1920's, with a serious setback in the Pennsylvania bituminous coal industry after the strike of 1927.

The depression was marked by a spontaneous revolt among workers against the collapse in labor standards. Then began a renewed struggle on the part of labor to express its rights and to force employes to recognize its organizations and interests. The enactment of the National Industrial Recovery Act, with its now famous Section 7 giving labor the right to organize without interference from employers and encouraging collective bargaining, ushered in a new era in the organization of labor.

The trend in the membership of Pennsylvania workers in labor organizations is indicated by the gain in dues-paying members affiliated with the American Federation of Labor for the total United States. This increase was 33 per cent between August, 1933, and August 1934. Probably the growth in Pennsylvania has been even greater, counting the re-unionization in the first few months of the NRA of the bituminous coal industry with its 120,000 wage earners. It is estimated that about 400,000 workers in Pennsylvania are dues-paying members of trade unions. This figure does not include unemployed members exempted from the payment of dues and many

workers voting for representation by trade unions in elections held under government auspices.

The growth of company unions immediately following the enactment of the NIRA characterized Pennsylvania as it did the United States. The National Industrial Conference Board reports a growth in employee representation plans of 61 per cent for the United States in the first five months following the passage of the Recovery Act. Fifty per cent of the employees in 3000 manufacturing and mining companies were reported to be under employee representation plans in May, 1934.* Such membership, however, is to these workers often merely a condition of keeping a job and may not represent a free choice as to the organizations through which they wish to bargain collectively with their employers.

Statistics of labor disputes show the readiness of workers to risk friction with the employers who control their jobs. These figures are available for the period since 1925 from the state Department of Labor and Industry as follows:

* National Industrial Conference Board, Individual and Collective Bargaining in May, 1934.

Year	Number of Disputes Reported	Persons Involved
1925	36	164,158
*1926	94	54,933
**1927	87	19,466
*1928	70	5,097
1929	158	23,169
1930	110	29,921
1931	159	59,198
1932	179	37,703
1933	629	370,384
1934 (6 months)	198	95,292

Source: Pennsylvania Department of Labor and Industry, Pennsylvania Labor and Industry in the Depression, 1934.

That the preponderance of disputes were based on alleged discrimination against union workers, on refusal to recognize labor organizations for collective bargaining or on other questions of the application of Section 7a of the National Industrial Recovery Act is shown from an analysis of the 604 cases before the Philadelphia Regional Labor Board between October, 1933, and December, 1934. Three-fourths of this number, 447, involved the application of Section 7a, and 128 other cases involved alleged violation of wage and hour provisions of NRA codes.***

The dispute stage of labor relations is normally superseded in case the employer recognizes the workers' organization, by the mutual acceptance of a formal agreement wherein

* Does not include bituminous coal industry.

** Does not include general strike in bituminous industry, involving about 100 operators and 100,000 miners.

***Harry Hoyle, Labor Disputes under the New Deal, Manuscript and supplement, Wharton School of Finance and Commerce, University of Pennsylvania.

each party makes certain guarantees to the other. Labor for instance, may agree not to strike so long as the employer observes certain hour, wage or other standards of employment.

A further achievement in collective bargaining between workers and employers is the mutual acceptance of machinery to settle grievances and disputes arising under the collective agreement. An increasing number of such agreements resulting from genuine collective bargaining are greatly to be encouraged as the surest, soundest way to industrial peace.

When mutual agreement between employer and employe on machinery for the settlement of disputes is lacking or fails, the mediation services of the State and Federal governments are available. Up to 1933, such assistance for settling labor disputes was the service of state mediators, or Federal mediators if the dispute extends beyond State lines, who have gone as individual government officials to the scene of the dispute to use their office to conciliate the disputing parties.

With the rapid increase in the number of disputes under the National Recovery Act, particularly because a great many of these arose over the application of Section 7a of the Act, the President of the United States created in August, 1933, a National Labor Board which in turn established two of its regional labor boards in Pennsylvania, one in Pittsburgh and

one in Philadelphia.

The labor board system may be illustrated by reference to the Philadelphia Regional Labor Board. It is composed of an impartial chairman and eight representatives each of employers and of labor and handles its cases chiefly by means of informal hearings at which both parties to the dispute are present. The purpose of the Board is to assist the disputing parties in reaching an agreement in order to avert or to end a strike. Failing an agreement, the Board makes a decision on the issues in the case. Decisions may be appealed to the National Labor Board. The Regional Board reports that it has effected satisfactory settlements in about 95 per cent of the cases handled.

The board method has some advantage over mediation by a single official in that it has greater prestige and has the power to render decisions even though it has no authority to enforce them. The individual mediator retains, however, peculiar usefulness with his greater freedom of movement and his greater opportunity for informal contacts on the scene of an impending dispute.

Cooperative relations between Federal mediators, State mediators and government labor boards, whether regional or industrial, should be part of any planning in this field of mediation of labor disputes.

In Pennsylvania the peaceful exercise of labor organizations' legitimate activities has been handicapped by the use

of police officers paid by the employer who is a party to the labor dispute. Strikers in the past have been killed in Pennsylvania and many have been injured by coal and iron police and company-paid deputy sheriffs. Too often, in time of strikes, employer-paid police officers have incited violence rather than curbed it.

Recent experience in Pennsylvania has shown that the State Police and the National Guard, when acting under instructions to maintain peace and order without prejudice either to the right of strikers to picket peacefully or to the right of workers to enter a plant without molestation, have been able to preserve peace and order without violence to any party or damage to employers' property.

Conclusions

Planning for the greater economic and social welfare of the people of Pennsylvania means giving particular attention to the physical conditions under which the 3,500,000 workers of the State are employed and to the amount of wages they shall receive for their labor. The entire economic and social welfare of the Commonwealth must rest on such a foundation.

The present insecurity and instability among the working population is due, to a large extent, to the fact that Pennsylvania labor legislation is not adequate to cope with existing conditions. Many of these laws require amendments or additions; some need extension revision; practically all of them should be re-read and reconsidered in the light of

conditions with which the Commonwealth must deal during and after the current depression.

Changes in the laws, which would contribute materially to the progress Pennsylvania must make for the greater economic welfare of its working population, have been discussed in this section of the report. They may be summarized as follows:

1. Further means of preventing accidents, particularly in the anthracite mining industry.
2. Prohibition of the employment of children under 16 years of age and the regulation of conditions of employment for all minors under 18 years of age.
3. Establishment of a shorter work week.
4. Creation of minimum wage standards.
5. Compulsory regular payment of wages earned and authorization of the Department of Labor and Industry to assist workers in the collection of back wages due.
6. Encouragement of genuine collective bargaining on terms of employment between organizations of employers and organizations of employees.
7. Elimination of the use of privately paid or company-controlled police officers, particularly in connection with labor disputes--as recommended by the Commission on Special Policing in Industry.

More crucial for effectuating sound labor conditions and policies than any of these specific recommendations are the

adequate financing of labor law administration and the securing of a highly qualified personnel for this administration on a civil service basis.

HOUSING

The possibility, and sooner or later the probable necessity, of large-scale public action in low-cost housing puts a new responsibility on the shoulders of State and local governments. As long as residential construction was entirely a matter of private enterprise, subject only to the rough checks of profit and loss, effective demand and a minimum of governmental restrictive measures, little or no planning was possible. But when any part of the business of house-production and administration becomes, in effect, a public utility enterprise, there must be comprehensive planning, backed by clear purposes and a complete understanding of the facts. Housing of the wrong kind, or in the wrong place, or at the wrong rentals, or constructed and administered inefficiently, may be, in the end, worse than no housing measures at all.

The immediate task confronting the Commonwealth may be summarized as follows:

1. To understand the housing needs of the State as to quality, quantity, location, price-range and method of production and administration.
2. To investigate the various Federal facilities and agencies in the housing field, either already available or proposed.
3. To promote and cooperate with those present or proposed Federal agencies which appear to offer the most fruitful possibilities for improving housing conditions and stimulating the construction industry in Pennsylvania.
4. To develop the necessary State and local agencies to

cooperate with the Federal authorities in housing matters, initiate action on their own account, and in general assume responsibility for the eventual successful solution of Pennsylvania's housing problem.

PENNSYLVANIA DWELLINGS

1. Census Distribution: Rural and Urban

A family, by the 1930 Census, is a group of more or less related people who live and usually eat together. A home is the place they occupy. The number of dwellings and homes is always the same, since vacant dwellings are not enumerated and an extra family is counted either as part of the occupying family or merely as separate lodgers. Both terms, for the purpose of housing research, mean an "occupied dwelling unit." In Pennsylvania, Census families are distributed as follows:

	Number	Percentage of Total Families	Median Family size*
Rural-farm families	184,151	8 %	4.01
Rural non-farm families	514,211	23	3.70
Urban families	<u>1,537,258</u>	<u>69</u>	<u>3.54</u>
The State: families	2,235,620	100	3.61

Of the urban families, 30 per cent live in Philadelphia, 46 per cent in the five cities of over 100,000 population, and 57 per cent in the 15 cities of over 50,000.

The total number of dwellings probably has decreased, since 1930, on account of demolitions. From 1930 through 1933, according to records of the Philadelphia Housing Association,

* Lodgers, servants and guests excluded.

19,783 persons were permanently dehousing by demolition in that city, or about 5000 families. During this period only 3,788 new dwellings were erected.

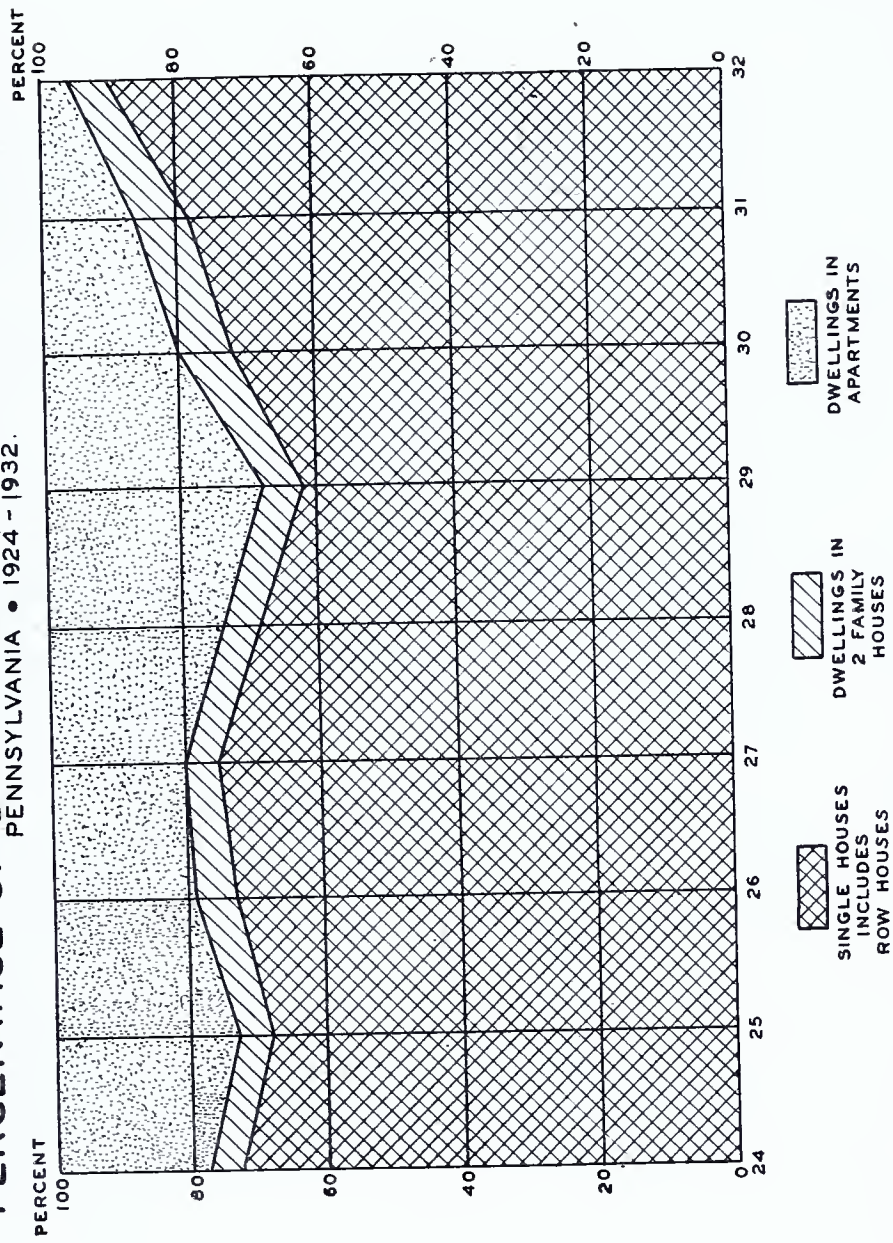
The section on Population shows that the State as a whole has gained very slightly, but most of the larger cities show a decrease of approximately 3 per cent. The situation is undoubtedly abnormal, but gives warning that planning for a stable population in the near future and the re-vamping of many of our building and finance practices are needed.

2. Company, One-Industry, and Stranded Towns

Rural housing is one problem. Urban is another. But Pennsylvania has another condition neither urban nor rural which warrants further classification.

There are more than 1,000 towns and villages and isolated groups of houses in this State which are wholly or largely owned by single mining or manufacturing companies. In 1928, according to a field survey conducted by the State Department of Health, there were 853 bituminous coal mining villages alone, with 49,760 families and 251,313 population. About 160 additional company towns were disclosed in rather uneven responses to a questionnaire recently sent out to Area Supervisors of the State Emergency Relief Board. A large number of these were anthracite or iron mining villages, but communities owned by the steel manufacturing, cement, leather, glass, clay and brick, chemical, railroad, power and other industries were included. They are located in 49 counties. Unincorporated,

PERCENTAGE OF DWELLINGS BY TYPE OF BUILDING PENNSYLVANIA • 1924 - 1932.



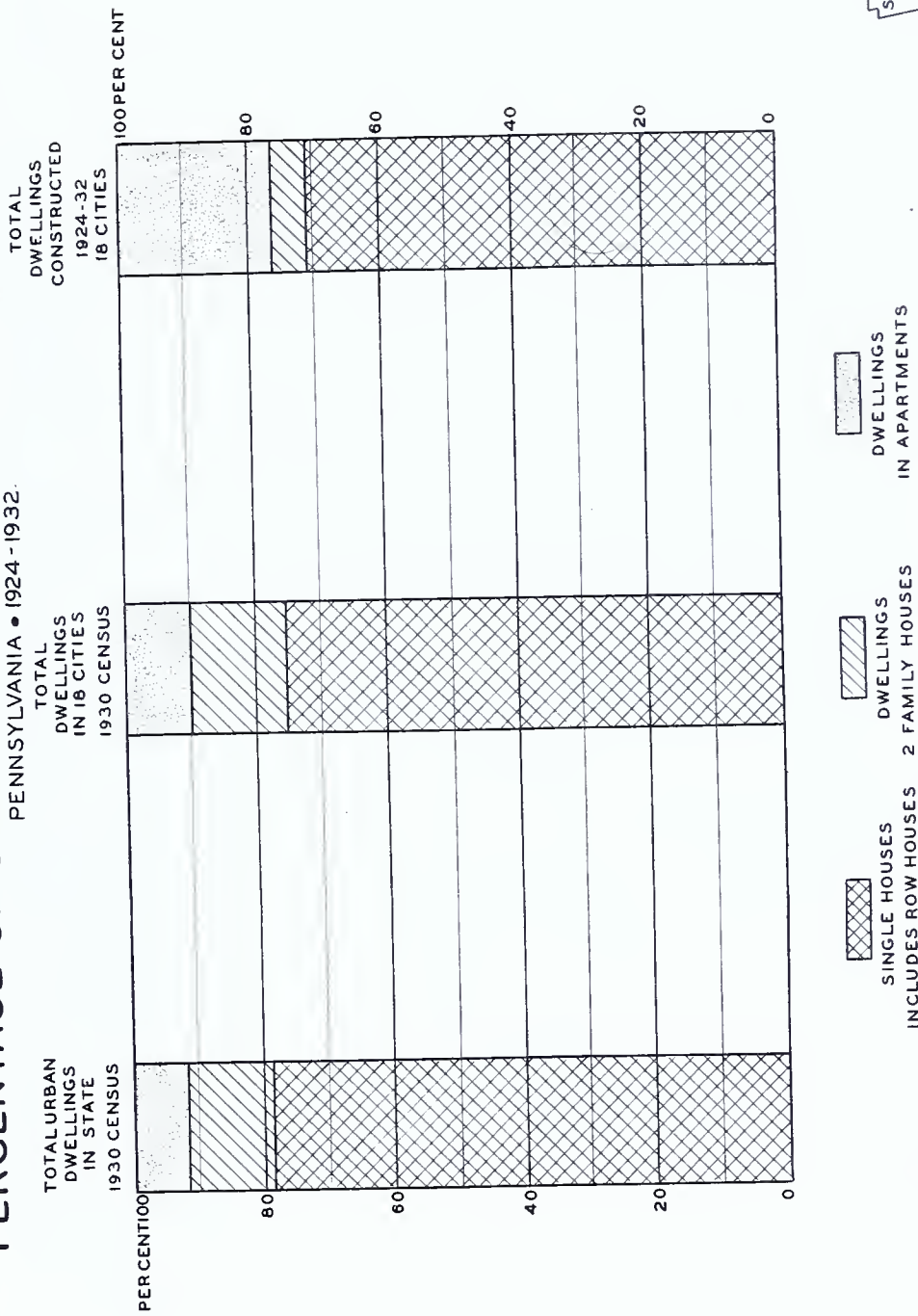
PENNA. DEPARTMENT OF LABOR AND INDUSTRY

FIGURE NO. 77



PERCENTAGE OF DWELLINGS BY TYPE OF BUILDING

PENNSYLVANIA • 1924 - 1932



for the most part, they would come under the classification of rural nonfarm communities in the Census.

In the same group, because there is no clear line of demarcation, belong the one-industry towns classification in general, whether or not the houses are owned by the companies. Responses to the questionnaire listed between 250 and 300, in 55 counties. There are probably many more.

Finally, there are stranded populations living in former company or one-industry towns where the plants have been permanently shut down and the inhabitants have no regular means of support. The State Emergency Relief Board survey mentions about 150 of these. There are certainly more of them, and a large proportion of the company and one-industry communities probably could be placed in this category.

At a conservative estimate, there are probably 100,000 families and 400,000 to 500,000 people living in company-owned houses, in villages dependent on a single industry, or in former industrial communities where all activity has been abandoned. (One of the semi-stranded villages is called Little Hope.)

3. Dwelling-Types

The single-family house is still the dominant dwelling-form. 82.9 per cent of all the dwelling units in the State are one-family houses, detached or in rows, as compared with 76.4 per cent for the United States as a whole.

OCCUPIED FAMILY UNITS 1930, BY TYPE OF STRUCTURE

	1-Family Houses		2-Family Houses		3-or more Family Houses	
The State	1,852,481	82.9%	250,102	11.2%	133,037	6.0%
Rural	647,806	92.8	43,196	6.2	7,360	1.1
Urban	1,204,675	78.4	206,906	13.5	125,677	8.2
Philadelphia	364,457	79.5	48,784	10.6	45,386	9.9
Pittsburgh	90,708	58.5	42,278	27.3	22,093	14.2
Scranton	21,099	64.1	7,974	24.2	3,854	11.7
Reading	21,878	79.1	3,220	11.6	2,561	9.3
Erie	19,839	70.4	6,480	23.0	1,878	6.7

The proportion of multiple dwellings is somewhat higher among structures put up since the war, but not greatly so.

This is shown on the accompanying chart.

According to Real Property Inventory surveys in 1934, the proportion of detached and row houses to total dwelling units is as follows:

	Detached 1-Family Houses	Row Houses
Allegheny County	55 %	(est.) 7 %
Erie (City)	55 %	2 %
Williamsport	47 %	3 %
Philadelphia*	4 %	69 %

Age of Homes

Probably at least half of the residential structures in Pennsylvania are more than 30 years old. Adequate information

* From the Occupancy and Vacancy Survey made by the Philadelphia Real Estate Board in 1932.

not available for the whole State, but recent surveys in four cities with varying conditions give a general indication.

<u>Proportion of Structures</u>	<u>Williamsport</u>	<u>Erie</u>	<u>Pittsburgh</u>	<u>Philadelphia*</u>
---------------------------------	---------------------	-------------	-------------------	----------------------

One-quarter	Over 50 yrs.	Over 40 yrs.	Over 46 yrs.	Over 44 yrs.
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One-half	Over 38 yrs.	Over 22 yrs.	Over 33 yrs.	Over 29 yrs.
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Three-quarters	Over 19 yrs.	Over 12 yrs.	Over 13 yrs.	Over 15 yrs.
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* Excluding three central districts not yet surveyed, which include the oldest sections of the city.

Thirty-five years was set by the Public Works Administration as a reasonable amortization period for its low-cost housing construction. It is worth noting that 54 per cent of the residential structures in Williamsport, 30 per cent in Erie, 43 per cent in Pittsburgh and 38 per cent in the districts of Philadelphia which have been surveyed, are more than 35 years old. Most of these old dwellings without doubt have paid for themselves many times over since their construction. Nevertheless many of them are located in sub-standard slum areas which cannot be economically rehabilitated today because of the persisting high scale of property prices.

Forty years, according to Bernard J. Newman, is about the limit of useful life for the average dwelling erected under present conditions. Approximately 25 per cent of all the residential structures in the above areas are more than 40 years old. This proportion would probably not be far out for the State as a whole. The newer suburban areas would show a lower share of old dwellings, but in rural districts and the older small towns many more than one quarter of the structures would

be more than 40 years old.

In the anthracite region 38 per cent of the company houses surveyed by the Bureau of Labor Statistics in 1930, were built before 1881 and 57 per cent before 1890.

5. Condition and Equipment

a. Urban Housing Conditions - The following tables are from the Real Property Inventory.

<u>State of Repair</u> (in % total Structures)	<u>Alleghen-</u> <u>ny Co.</u>	<u>Erie</u>	<u>Williams-</u> <u>port</u>	<u>Phila-</u> <u>delphia*</u>
Structures needing:				
Minor Repairs	41 %	42 %	41 %	22 %
Structural Repairs	13 %	11 %	20 %	2 %
Structures unfit for use	3 %	1 %	1 %	2 %

State of Equipment (in % total dwelling units)*

Dwelling units with:

No running water in building	5 %	3 %	1 %	1 %
No hot water facilities	23 %	14 %	23 %	8 %
No bath tubs or showers	27 %	16 %	21 %	7 %
No central heat	44 %	35 %	28 %	8 %
No inside toilet	16 %	5 %	9 %	6 %

To fill out the incomplete picture of conditions in Philadelphia, a paragraph is quoted from a survey of several thousand samples in eight industrial districts, made in 1932 by the

* Report on Philadelphia so far omits two central districts with high proportion of sub-standard dwellings. Philadelphia figures on Equipment are on structures in relation to total structures not dwelling units.

Philadelphia Housing Association:

"In 45 per cent of the properties studies, the water closets are located in the yards; one house in every 25 has to rely on the yard hydrant for water supply; about two out of every five lack a bath tub; in one-half the houses the only heating equipment is a kitchen stove; 3 per cent still use kerosene lamps for illumination.

"Only a few years ago," says Dr. Edith Elmer Wood in her latest book on housing, "Philadelphia had 60,000 privy vaults."

Benjamin Ritter of the Pennsylvania Housing and Town Planning Association made a housing survey in Scranton in 1930.

"The housing standards established in the early days of the anthracite industry," he says, "are still represented in Scranton's housing problem of today....While most of the 'company houses' have been replaced with better houses, settlements of this kind have left an indelible stamp on the city....Minimum standards of living were established in communities that produced more wealth per capita possibly than any other section of Pennsylvania in a given length of time."

In a survey of 500 buildings in slum areas, he found that 22 per cent covered their entire lot area, and 40 per cent were rear buildings or faced only on alleys. Sanitary conditions were comparable.

The housing problem is not entirely a matter of houses. "Scranton," says the report on that survey, "has no sewage disposal plant, but continues to discharge its raw sewage into

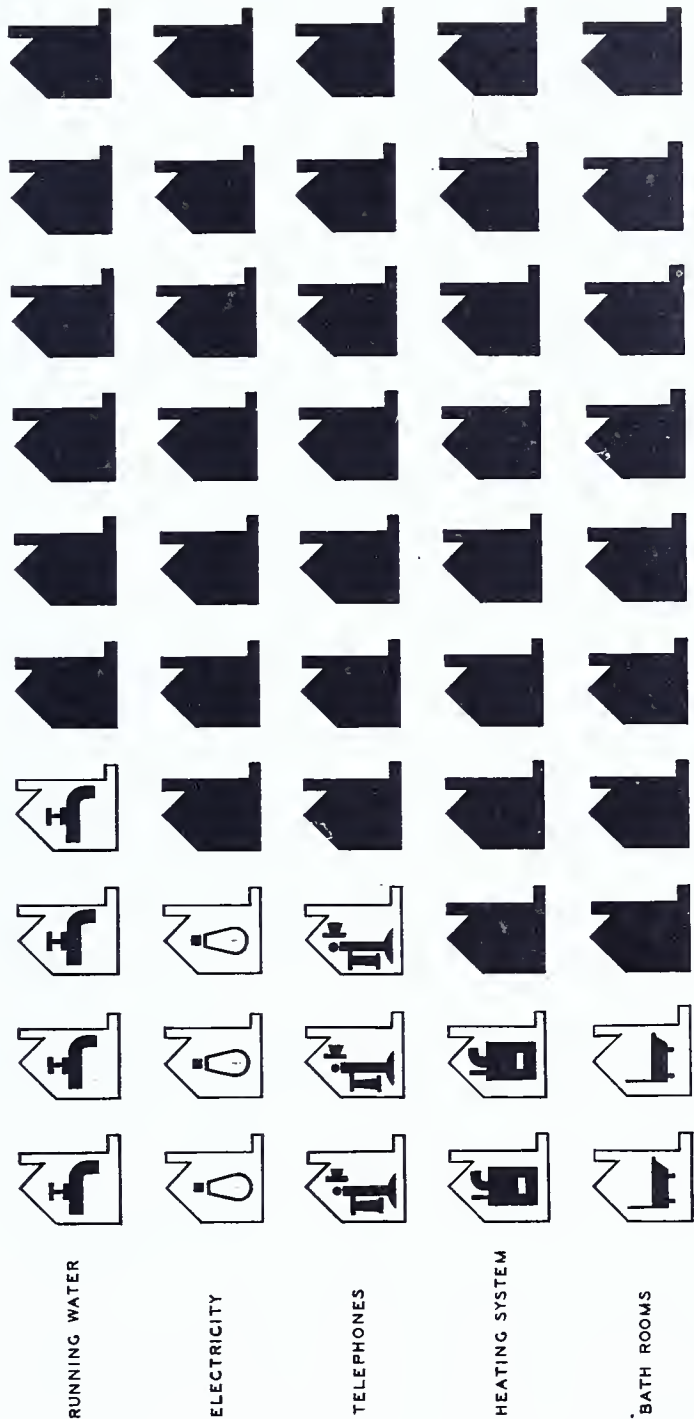
the Lackawanna River at some 60 different points. This gives rise to serious stream pollution, and renders the river virtually an open sewer running through the central section of the city. Residents in these areas are annoyed with foul air the year round." There are hundreds of other communities in Pennsylvania who are thus violating their natural amenities.

"Over a million Pennsylvania people," says Mr. Ritter in the last report of the Association, "live in 'city' homes without sewer connections or plumbing facilities." Many large Pennsylvania cities, including Lancaster, have no building ordinances and as many as half of their dwellings are without sewer connections. In 1925 Easton, with 40,000 population, had less than 200 houses connected with sewers; Conshohocken had no sewage system at all.

b. Rural Areas - Little comprehensive data are available on rural housing conditions, although all evidence indicates that a large number of old run-down houses, many vacant for years, have been occupied during the past five years by former city-dwellers.

The proportionate number of farms having certain facilities in 1933, as collected for the Pennsylvania Crop and Livestock Report is shown on the accompanying chart, by regions. Likewise the rate of change since 1926.

c. Rural-Industrial Housing - A good picture of living conditions in mining villages can be found in a study by Elizabeth Johnson of the Pennsylvania Department of Labor and Indus-



HOW MODERN ARE PENNSYLVANIA FARM HOUSES
1930

EACH FIGURE = 10%



PLANNING
BOARD

FIGURE NO. 79

HOW MODERN ARE PENNSYLVANIA FARMS?

The proportion of farm-houses having certain equipment in 1933, as reported in the Pennsylvania Crop and Livestock Bulletin for 1933. Figures on total farms and on roads from U. S. Census, 1930.

roads from U. S. Census, 1930.			Per Cent of Farm-houses which in 1933 had					
Regions and Counties	Total Farms 1930	Farms on Unimproved Dirt Roads % 1930 *	Running Water	Bath Rooms	Heating Systems	Elec- tricity	Tele- phones	Radio
NORTHWESTERN								
Crawford	Mercer	18,492	56	33	14	19	34	34
Venango	Erie							
Forest	Warren							
NORTH CENTRAL								
Bradford	McKean	15,800	63	43	16	18	24	31
Cameron	Potter							
Clinton	Sullivan							
Tioga	Elk							
Lycoming								
NORTHEASTERN								
Lackawanna	Wayne	8,937	65	46	19	30	33	42
Susquehanna	Wyoming							
WEST CENTRAL								
Armstrong	Beaver	18,234	66	45	13	27	19	39
Lawrence	Clarion							
Indiana	Butler							
Jefferson								
CENTRAL								
Montour	Blair	24,642	55	33	11	17	25	27
Cambria	Centre							
Clearfield	Perry							
Columbia	Snyder							
Huntingdon	Juniata							
Mifflin	Union							
Northumberland								
Dauphin								
EAST CENTRAL								
Carbon	Pike	12,553	56	36	18	28	40	24
Lehigh	Luzerne							
Schuylkill	Monroe							
Northampton								
SOUTHWESTERN								
Allegheny	Fayette	21,426	51	46	20	31	29	33
Greene	Somerset							
Washington								
Westmoreland								
SOUTHEASTERN								
Montgomery	Berks	30,466	30	42	25	31	49	38
Chester	Bucks							
Lancaster	Delaware							
Lebanon								
Philadelphia								
SOUTH CENTRAL								
Franklin	Adams	21,829	51	26	10	14	30	27
Bedford	Fulton							
Cumberland	York							
THE STATE		172,419	52	39	16	23	32	33
% Change, '26 - '33		200,413		+45	+26	-5	+112	-42
		(1925)						+166

* This proportion probably has been considerably decreased since that time.

try, in the departmental publication for November, 1931. Also in the recent book, "I Went to Pit College," by Lauren Gilfillan.

A thorough sanitary survey of 853 company-owned bituminous coal-mining villages was made in 1928 by the State Department of Health. The report was prepared by Howard Bronson, Housing Engineer, and in his opinion conditions in these communities are worse now than they were at that time.

The villages were owned by 448 companies and located in 27 counties. The population was 251,313 and the number of houses 62,038. Of the 853 villages, only 136, or 16 per cent, had satisfactory sanitary conditions on the second inspection, recommendations having been made after the first visit.

Conditions in the 853 villages may be summarized as follows:

Water Supply

531, or 62%, supplied by wells or springs only
321, or 38%, had unprotected sources

Excreta Disposal

43, or 5%, had any sort of sewage system
817, or 96%, had privies
492, or 58%, were definitely insanitary

Waste Disposal (Kitchen and laundry water)

693, or 81%, used the surface of the ground
Almost all had insanitary conditions

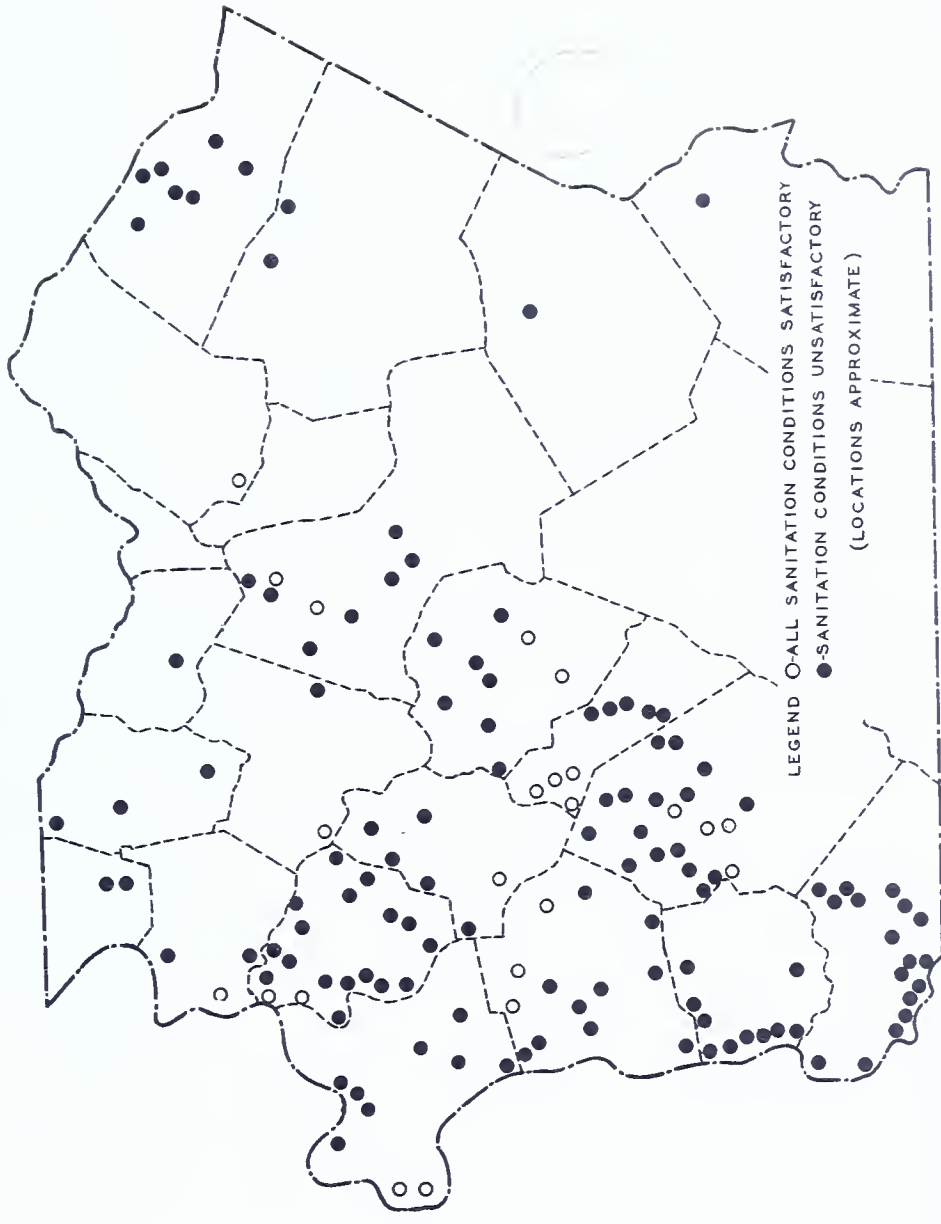
Milk Supply

495, or 58%, used canned milk

Leifur Magnussen, in his "Housing by Employers in the United States"* describes the soft-coal towns of Pennsylvania:

* Bureau of Labor Statistics, 1920

DEVELOPMENT OF SANITATION IN A TYPICAL COAL MINING COUNTY.



FROM SANITARY SURVEY BY
PENNA. DEPARTMENT OF HEALTH

SPB

FIGURE NO. 80

"The towns of the region have dirt roads, generally no sidewalks, and gutters only rarely. A piped-water system and sanitary sewers are infrequently encountered. . . Trees, lawns, and flowers are conspicuously lacking. . In the coke region of Pennsylvania the large majority of towns are practically destitute of all such growth; the neighboring hillsides have been burnt bare by the noxious fumes of the coke ovens. In the location of dwellings and ovens with respect to each other no regard has been had for the direction of the prevailing winds."

Only 2.4 per cent of the 10,000 dwellings surveyed in his study had inside baths and toilets. Only 48 per cent had either gas or electricity for lighting.

In the anthracite towns, Mr. Magnussen found that 45 per cent of the company houses surveyed had no modern conveniences at all. Conditions in the steel towns were somewhat better, but even so had no modern conveniences.

d. Housing and Public Health - A definite relation exists between bad housing and many kinds of disease and debility. It is often forgotten, however, that probably most of the abnormal conditions usually prevailing in slum areas are the direct result of poverty, and only indirectly of bad housing. It should not be assumed that eliminating slums without raising the purchasing power of slum-dwellers, would automatically remove most of those extra expenses incurred by all cities in their slum districts.

The following study was compiled recently by Mr. Ritter

for the Philadelphia City Planning Commission. The slum areas surveyed contain 13.5 per cent of the population, but cover only 4.9 per cent of the area of the city.

	<u>Rate per 1000 Population</u>	
	<u>Entire City</u>	<u>13 Slum Areas</u>
Tuberculosis	7.68	12.25
Communicable diseases (ex. venereal and pneumonia cases)	11.94	16.36
Family Relief	54.58	252.48
Housing Complaints	12.82	37.78
Adult delinquency (12 classifications)	3.86	8.58

A survey was made by the Pittsburgh Housing Association of housing conditions of tuberculosis cases coming under the supervision of the Public Health Nursing Association. 33 per cent of the new cases coming were from the "Hill District" where the survey was made. Out of 400 cases living in that district, it was found that:

One-third have cellar or basement living rooms, half of them used for sleeping; 30 per cent of all living rooms without adequate light or air; 30 per cent have defective plumbing; more than 50 per cent have no baths; 81 families, more than 2 per room; 71 families, doubled up with at least one other family.

REPLACEMENT

1. Slums and Blighted Districts

Any estimate of housing needs arising from inadequate

present physical conditions must depend entirely on the level picked as a minimum housing standard. If it is proposed to eliminate only those dwellings which are structurally unsafe or in bad sanitary condition at least 2 per cent of the dwellings in the State, or about 45,000, would come within this category.*

But such a classification provides no sound basis for reconstruction. Even if the 45,000 were demolished and a new modern dwelling built in place of each, little would be contributed to the rehabilitation of our cities. The new houses probably surrounded by half-decayed structures and located within an obsolete street-pattern, soon would deteriorate to the level of its neighbors.

If, on the other hand, every dwelling should have direct sun, clean air, relative quiet, a reasonably decent outlook, modern sanitary facilities, central heat, and an adjacent open space suitable and safe for children's recreation, it would be found that whole districts, almost whole cities, would have to be demolished and built over. Thousands of dwellings put up since 1920 would not conform to such a standard without complete reconstruction and a different street-plan.

The City Planning Commission of Philadelphia has just completed a survey of thirteen distinct slum areas. All of these districts are definitely "sub-standard", all contain unsanitary conditions, dilapidation, vandalism, and more or less chaotic land-sweating. All, likewise, are believed to be large enough

* Based on Real Property Inventory figures.

for efficient reconstruction. Together they house at present about $13\frac{1}{2}$ per cent of the population of the city.

It is estimated that 10 per cent of the families in the State live in similar districts under corresponding conditions, with a higher proportion in certain heavy-industry areas, mining towns and run-down rural areas.

On this basis, approximately 225,000 families need to be rehoused immediately. A large share of these families need not, and probably should not, be rehoused on their present sites. Many congested districts should be transformed eventually into parks, safeguarding such neighboring areas as are not already blighted. A large number of the mining and one-industry towns probably should be abandoned and their inhabitants rehoused wherever work opportunities may be found.

The replacement problem, however, is complicated by the fact that the real estate and municipal financial structures are still geared to limitless expansion. Slum properties are still being held and taxed as if they could soon be put to some more intensive use. This means, usually, that they are far too expensive for economical reconstruction as low-cost housing developments.

Dwellings have been financed without adequate allowance for depreciation and obsolescence, on the tacit principle, as Mr. Newman pointed out,* that appreciation of land-values would make up for depreciation of structure in the long run. The

* 1933 Report of the Philadelphia Housing Association

EVOLUTION OF 'BLIGHTED AREAS'

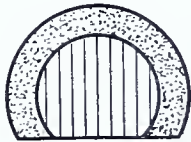


FIG. 1 - PRIMITIVE CITY.

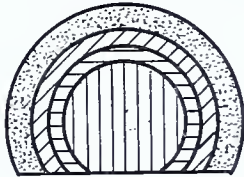


FIG. 2- CONCENTRIC EXPANSION.

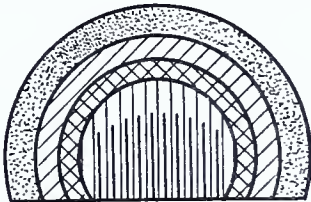


FIG. 3 - ARRESTED GROWTH OF CENTER BY VERTICAL EXPANSION.

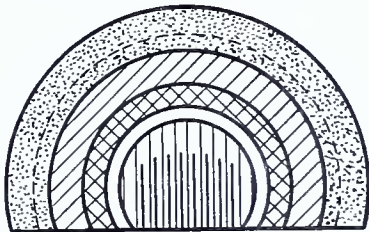


FIG. 4 - CENTRAL AREA SHRINKING DUE TO FURTHER VERTICAL GROWTH AND LESSENER SPACE NEEDS.

KEY.

	COMMERCE AND LIGHT INDUSTRY.
	ACTIVE RESIDENTIAL AREA.
	EXTENSION COMMERCIAL AND LIGHT INDUSTRY.
	INACTIVE RESIDENTIAL AND BLIGHT.
	ACTUAL SLUM AREAS.
	INACTIVE COMMERCE AND LIGHT INDUSTRY.
	VERTICAL EXPANSION IN HIGH BUILDINGS.



same principle of endless rise in land-values, and thereby in assessments, has guided the extension of costly municipal services far out into the suburbs, while larger and larger central areas succumbed to blight and decay.

Increased urban land-values are dependent on two other factors; increase of population as a whole, and continuing advantage of centralization. The rate of increase in population of the State is rapidly slowing down, and will reach a point of stability not so many years hence. Furthermore, there are indications of an even more pronounced downward trend in the future population of the biggest cities.*

"The task," as Henry Wright said in the Survey Graphic for August, 1933, is "to set about a reorganization of the purpose of our city development, adjusted to a stabilized population rather than anticipated growth, and directed to a gradual though complete renovation of our dilapidated housing facilities."

2. Future Replacement Needs

There is no way scientifically or statistically to determine a fair rate of replacement to meet the needs of depreciation and obsolescence in dwellings. Age is by no means the only consideration. The proportion of flimsy jerry-built houses probably has been greater since the war than before, and there are today many dwellings only 10 or 15 years old which need replacement more than some of the more solid structures

* See Section on Population.

standing for more than a century. However, the dwelling over 40 years old which is habitable and modern in plan and structure and relation to surroundings is the exception.

If the Real Property Inventory figures are an indication for the State as a whole, approximately 25 per cent of existing dwellings are more than 40 years old. Another 20 per cent will become 40 years old during the next ten years.

Assuming a replacement rate of 1 per cent annually, approximately 22,500 dwellings would require replacement each year after the estimated 225,000 dwellings requiring immediate clearance are all replaced.

QUANTITATIVE SHORTAGE

There are two kinds of space deficiency - one of rooms in relation to individuals, and the other of dwelling units in relation to families.

1. Room Overcrowding

The dwellings in the State as a whole contain enough rooms to provide decent minimum privacy for a single family without lodgers. When overcrowding occurs it is usually the result either of extreme poverty or of high rents, a lack of available living quarters in that vicinity and subsequent doubling up.

The Real Property Inventory, in common with most accepted standards, called dwellings with one to two persons per room "crowded", two to three persons per room "overcrowded" and three or more greatly overcrowded. (The kitchen and living room are counted as rooms.) In localities covered by the In-

ventory in the State so far, conditions were found to be as follows:

	Dwellings housing more than 1 person per room	Percentage of total dwelling Units
Allegheny County	78,724	25.2
Erie	3,534	10.65*
Williamsport	1,010	8.32
Philadelphia (15 outlying wards, with 272,816 dwellings)	31,020	11.37
Twenty "urban-like" townships in Allegheny County	8,355	33.2

A survey of the 6309 families represented by recipients of the Mothers Assistance Fund since 1929 showed that 70 per cent were living in dwellings containing one or more persons per room. Moreover, 874 families, or $14\frac{1}{2}$ per cent were living in homes containing two or more persons per room.

Last year a survey of overcrowding and rental conditions among relief families in Philadelphia was made by the Joint Committee on Research of the Community Council of Philadelphia School of Social Work. The following summary may be quoted:

"Over half were living in houses averaging less than one room per person. Among the rent-free group of families the situation was even worse - an average of 4.0 persons per household in 2.4 rooms. Individual instances are much worse even than this...."

Housing programs must be based on dwelling units and districts rather than rooms. Nevertheless, a rough calculation of

quantitative room shortage may be worthwhile here.

Using the Real Property Inventory figures as a basis, and assuming that these families need an average of $1\frac{1}{2}$ rooms more per household for a decent standard of occupancy, it is estimated that more than 400,000 new rooms are needed. This would mean 100,000 new dwellings of four rooms each.

2. Vacancies and Doubling Up

If it were not for the sharing of dwellings by a large number of families, the housing shortage at present would be extremely acute. This is true despite the number of vacancies that exist and without allowing for the fact that much of the population loss of the larger cities during the past four years should be temporary.

Doubling up is due to poverty and to the fact that rents, much as they have declined, have by no means come down in proportion to incomes.

An Occupancy and Vacancy Survey covering the entire city was made by the Philadelphia Real Estate Board in 1932. This brought out the following facts:

Total dwellings	474,348	100%
Total vacancies	42,250	8.9 %
Vacant dwellings		
unfit for habitation	3,457	.7 %
Total net vacancies	38,793	8.2 %
Total extra families	28,143	5.9 %

This leaves a net surplus of only 10,650 dwelling units, or 2.3 per cent. The figures on vacancies of dwellings unfit for habitation is probably rather low. In March, 1932, the

Philadelphia Housing Association surveyed a cross-section of the city containing 88,619 one-family dwellings. They found a vacancy rate of 5.5 per cent, but they also found that, eliminating dwellings not suitable for occupancy in their state of disrepair, those held for sale, and those not in the market, the vacancy rate of available houses was 3.6 per cent, without counting extra families, which were not included in the survey. Five per cent vacancies are usually held to be necessary in order to allow for adequate selection on the part of prospective tenants. Vacancies fit for habitation in row houses, according to the Real Estate Association Survey, were only 21,390, while there were 24,230 extra families living in row houses. If occupied dwellings unfit for habitation were subtracted, the situation would have been even more acute.

Roy Wenzlick of St. Louis, editor of the Real Estate Annalist, estimates that vacancies throughout the country, about 10 per cent a few years ago, have now been halved.

The Real Property Inventory, taken in 1934, has so far been tabulated for Pittsburgh, Erie, Williamsport, and about 82 per cent of Philadelphia. The accompanying chart summarizes the results. It shows that if an adequate allowance is made for choice, if dwellings definitely unfit for habitation are subtracted, and if families abnormally doubled up were able to seek quarters of their own, there would be a deficiency per 1000 families ranging from 2.2 dwellings in Erie to 146.8 in Pittsburgh. This is despite the fact that these cities have

EVIDENCE OF QUANTITATIVE SHORTAGE: REAL PROPERTY INVENTORY, 1934

	Total Dwell- ing units	Vacant Dwelling Units	Vacant, Percent of Total	Net Surplus*, Percent Vacancy Per cent	Percent of Percent Unfit Dwellings	Extra Families	Net short- age of dwellings	Deficiency per 1000 families	Population changes 1930-1934
Pittsburgh	153,810	12,443	8.1	3.1	3.8	15.0	24,214	146.8	-3.9
Erie	33,179	3,558	10.7	5.7	.8	5.2	68	2.2	-8.8
Williamsport	12,141	928	7.6	2.6	1.1	5.3	467	39.3	-8.2
Philadelphia**	383,672	30,444	7.9	2.9	2.2	4.7	15,198	39.8	-4.6***

All percentages relate to total dwelling units.

* Allowing 5% vacancies for adequate selection and competition.

** Except two districts in older central part of city, containing about 18 of total residential structures.

***Percentage for entire city.

lost from 3.9 per cent population (Pittsburgh) to 8.8 per cent (Erie) in four years, according to the Unemployment Census.

In the Philadelphia study of unemployment relief families, 32.3 per cent of the families renting dwellings in March, 1933, shared their dwellings with at least one extra family. Among the rent free households, this proportion was 57.9 per cent.

It is estimated that fewer vacancies and more cases of doubling up occur in the smaller communities and rural areas which have gained population during the past four years. In the Allegheny County inventory, vacancies for the whole county were 7.0 per cent, with 8.1 per cent in Pittsburgh and 5.8 per cent in 20 fairly populous unincorporated townships.

The Unemployment Census of 1934 shows that in a few small towns, selected at random, the proportion of extra families to total families varied from 5 to 10 per cent with an average of 8.4 per cent. By a preliminary hand count, Carbon County was found to have 7 per cent extra families and Lycoming 8 per cent.

In the same census, it was found that vacancies amounted to only 3 to 4 per cent of total dwellings. In Delaware County they were 5.7 per cent with a higher rate in boroughs and Chester City and a lower rate in townships.

3. New Dwellings Needed

A minimum housing standard should allow one dwelling per family, with enough vacancies to permit adequate selection, flexible movements, and a check on exploitive rental schedules.

There is at present practically no demand for dwellings within

the price-range of new construction between 1920 and 1929. But there is nevertheless a deficiency of separate dwellings in proportion to the total number of families, and one major function of any State or Federal planning must be to devise means whereby this demand, more or less hidden at present, can be satisfied, whether by more and higher wages, or lower rentals for new dwellings, or both.

Based on a liberal estimate of 7 per cent vacancies throughout the State, and a conservative estimate of 6 per cent of total dwellings which could be occupied by families now without separate accommodations, there is a surplus of 1 per cent. Allowing 5 per cent (the figure used by both the Philadelphia Housing Association and the New York State Housing Board) for adequate choice, there is a net deficiency of 4 per cent.

There are approximately 2,250,000 dwelling units in the Commonwealth. The state, therefore, is more than 90,000 dwellings short.

POPULATION TRENDS AND HOUSING*

According to estimates of the population of Pennsylvania, more than 13,000 dwellings per year will be needed throughout the next decade merely to house additional population.

Families and Marriages

As the population grows older, the relative number of children and the size of the family decrease and, for a time, the number of families increases faster than the population as a

*See section on Population.

whole. At the same time various social and economic forces tend to decrease the size of the family unit seeking separate accomodation. That all these factors must be studied in relation to the housing problem whenever fresh information is available is proved by the experience of England. There, after 10 years of constant governmental effort to relieve a housing shortage, and the construction of approximately 1,250,000 state-aided houses, it was found that the deficiency in relation to family units was almost as great at the end as at the beginning. This was because families had increased faster than population.

A factor of importance in a housing program is a sudden jump in the marriage rate. Last year, after declining steadily in 1930, 1931 and 1932, the number of marriages in Pennsylvania increased from 56,085 in 1932 to 63,459. With any signs of real economic recovery a further large increase may be expected with a corresponding direct rise in the demand for housing.

Location Trends

The movement of population from rural areas to urban has been halted temporarily at least. That part of the population of the larger cities which migrated to smaller towns may possibly stay there, but the thousands of families who moved out to sub-marginal farm territory probably will return to industrial centers as soon as there is any real opportunity for employment. For a few years the estimated average drift of 5000 persons per year may be sharply increased. It is estimated 1500 new non-farm dwellings per year would take care of this movement. In

several of the smaller Pennsylvania centers, those with diversified industries, there is already an acute housing shortage. In Meadville, county seat of Crawford County, bankers, industrialists, realtors and trade unions have joined in petitioning the Federal Government for aid in the construction of badly needed dwellings.

Even if the large cities grow proportionally with the small ones, the effects of slowing down must be felt in the house-production field. The administration of our cities and our methods of financing residential construction have alike been geared to rapid growth. The new subway or rapid transit line could always be paid for later on out of increased assessments. People could, with a relative degree of safety, buy property or construct houses on a shoe-string, just as they bought stocks on slender margins. The opposite is true at present. Some cities have already rezoned central districts at a lower degree of density. Speculative financing, short-term mortgages with high discounts and bonuses, high rates of interest, were all part of a scheme of house-production which, even if there were no depression, would find itself unable to meet a revolutionary new situation.

Stranded populations, particularly in the coal regions, form a special problem which Pennsylvania housing and planning authorities will be called upon to face. Any Federal or State-aided large-scale housing program would of necessity be one of

DECREASE IN MEDIAN RENTALS

1930 - 1934

\$5 \$10 \$15 \$20 \$25 \$30 \$35

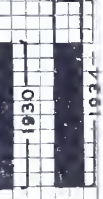
ALLEGHENY CO.

PITTSBURGH

ERIE

WILLIAMSPORT

PHILADELPHIA



U. S. CENSUS 1930
REAL PROPERTY INVENTORY 1934

the strongest factors in such a movement.

As a basis it is estimated that 10,000 dwelling units are a minimum first need in long-time planning for the rehabilitation of stranded workers.

NEEDS FOR THE NEXT 10 YEARS

<u>Immediate needs:</u>	Number of dwelling units
To replace accumulated sub-standard areas.....	225,000
To meet the quantitative shortage.....	100,000
To re-locate stranded populations.....	10,000
	<hr/> 335,000
<u>Annual needs per year for next ten years:</u>	
To balance population increase.....	13,000
Farm to nonfarm drift.....	1,500
	<hr/> 14,500

If the immediate needs were to be met in the first five years, in addition to annual needs, it would mean 81,000 new dwellings per year for five years and 14,500 thereafter. The 1 per cent replacement rate might then go into effect, adding 22,500 and making a total of 37,000 per year, for the last five years.

The total for 10 years would be just under 600,000, or an increase of approximately one-fourth over the total present number of dwellings. At the same time, 362,000 dwellings unfit for habitation would have been demolished.

CAPACITY TO PAY

1. Rent Levels, 1930 and Now

In 1930, median rentals on non-farm homes in Pennsylvania were: In the State as a whole \$26.91; urban, \$31.29; rural non-farm, \$13.26.

An accompanying chart shows median rentals by counties. They ranged from less than \$10.00 in four counties to \$31.55 in Montgomery, \$33.03 in Allegheny, \$36.81 in Philadelphia, and \$38.75 in Delaware.

How rent-levels have fallen since 1930 is shown by the following from the Real Property Inventory:

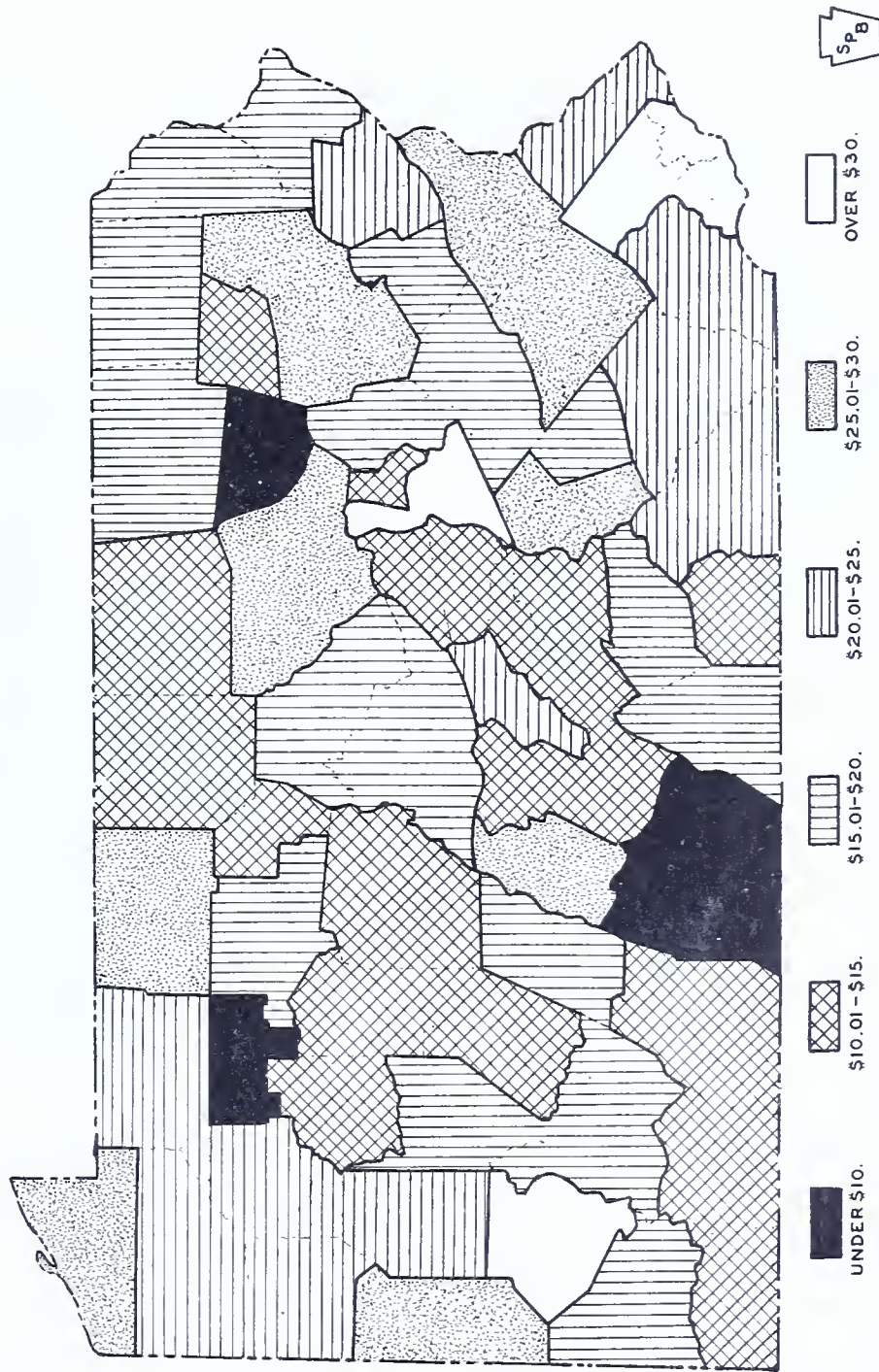
	Median Rentals		%
	1930 (Census)	1934 (RPI)	Decrease
Allegheny County	\$33.03	\$23.60	29
Pittsburgh	36.81	25.70	30
Erie (City)	30.55	21.00	31
Williamsport	29.71	19.05	36
Philadelphia (14 wards with 960,000 population, central slum districts not included)	41.00	29.00	29

Advance reports from a recent intensive survey of the families in every tenth block in Allegheny County show the following with regard to tenant families:

Median <u>nominal</u> rentals per annum		
1929	1933	decrease
\$353	\$284	20%

The median ratio of nominal rental to total family income

MEDIAN RENTALS 1930



U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

FIGURE NO. 83

in 1933 was, however, about 43 per cent, with the obvious result. Thirty-nine per cent of the families reported that they were behind in rent payments. The annual rent bill of these families was \$4,905,100 in 1933. But their total unpaid rent amounted to \$1,318,460. The same 16,000 Allegheny County tenant families reported that the following facilities were included in their rents in 1929 and 1933.

<u>Facilities included in rent</u>	<u>Percentage of families reporting</u>	
	<u>1929</u>	<u>1933</u>
Furnishings	1.02	1.12
Electricity	3.52	5.08
Gas	3.84	5.63
Water	66.97	80.83
Heat	6.67	10.69
Refrigeration	1.31	3.04
Garage	3.02	4.81

From a survey of application blanks, from 1929 to date, of recipients of Mothers Assistance Fund aid, it is shown that the median rental for this income-group was \$16.20. Seventy per cent of these families were overcrowded as to rooms.

2. Family Incomes

A better gauge of the market which must be met, if new housing is to be both produced and consumed, can be derived from the following tables, which show advance tabulations from an intensive housing survey recently completed by the Bureau of Business Research of the University of Pittsburgh. This survey covered about every tenth block in Allegheny County and is one of the primary sources of data on family-income groups.

Family-income groups of present tenants in Allegheny County for 1929, 1932 and 1933, by quartiles, were as follows:

FAMILY INCOME GROUPS, ALLEGHENY COUNTY FAMILIES, 1933*

<u>INCOME GROUPS</u>	<u>O W N E R S</u>		<u>T E N A N T S</u>		<u>T O T A L</u>	
	<u>(Number of cases and cumulative percentages)</u>					
\$0	1103	8.9	1447	9.0	2550	9.0
\$1 -- 249	1303	19.4	2261	23.1	3564	21.5
250 -- 499	1756	33.6	2844	40.9	4600	37.7
500 -- 749	1642	46.9	2239	54.8	3881	51.4
750 -- 999	1245	57.0	1731	65.6	2976	61.9
1000 -- 1499	1941	72.7	2431	80.8	4372	77.3
1500 -- 1999	1357	83.7	1493	90.1	2845	87.3
2000 -- 2999	1168	93.1	1064	96.7	2232	95.2
3000 -- 4499	556	97.6	407	99.3	963	98.6
4500 -- 7499	198	99.2	82	99.8	280	99.5
7500	101	100.0	36	100.0	137	100.0
<u>All Families</u>	12,370		16,030		28,400	

From advance tabulations of a survey covering about every tenth block in Allegheny County, conducted by the Bureau of Business Research of The University of Pittsburgh.

THE RENTS WHICH ALLEGHENY COUNTY TENANTS CAN
AFFORD BY INCOME GROUPS.

1933 Income Group	Percentage of Families Each Income Group	Average Family Income - 1933	Monthly Rent Payable (at 1/60 of Annual Income)
None	9.0%	-----	-----
\$1 - \$249	14.1%	\$167.52	\$ 2.80
\$250-\$499	17.7%	381.42	6.35
\$500-\$749	14.0%	644.41	10.75
\$750-\$999	10.8%	893.83	14.90
\$1000-\$1499	15.2%	1181.03	19.70
\$1500-\$1999	9.3%	1689.46	28.15
\$2000-\$2999	6.6%	2301.77	38.35
\$3000-\$4499	2.5%	3367.48	56.10
\$4500-\$7499	.5%	5193.02	86.55
\$7500-&-over	.2%	6491.89	108.20

Median rent payable, about \$11 per month per dwelling.

	1929	1932	1933
25% families, under	\$773	\$293	\$270
50% of families, under	\$1236	\$726	\$649
75% of families, under	\$1964	\$1385	\$1225

The table on Allegheny County incomes shows median incomes for 1933 as follows: Owners, \$827; tenants, \$663; average, \$726.

More than 80 per cent of the families who are now tenants cannot afford to pay more than \$20.00 a month rent. There is no reason to suppose that these figures would be greatly different for the whole State. Mordecai Ezekiel, economic adviser for the Agricultural Department, recently stated that a moderately full life for a family under American conditions would cost \$2500 a year. The median income of families in the State, if the Allegheny County survey is a fair index, is \$726 from all sources.

THE BUILDING INDUSTRY

1. Building Trades Workers

In 1920, according to the Bureau of the Census, 213,743 workers in Pennsylvania were directly dependent on the building trades for employment. This was the seventh largest occupational group in the State. In 1930 the building trades group showed the second highest rate of unemployment, and in 1934, according to a survey by the State Department of Labor and Industry, almost three-fourths of all construction workers were totally without employment. This was a proportion almost double that of the next highest, the coal miners.

Seven largest occupations Pennsylvania 1930 (Census)	Number of workers	Percentage of Unemployment	
		Aug. 1930 (U. S. Census)	Oct. 1934 Dept. Labor and Industry

1. Trade	562,940	4.1	8.4
2. Transportation and Communication	323,982	6.0	32.9
3. Coal mining	296,694	22.1	41.0
4. Textile and clothing	266,981	19.6	27.9
5. Metal	266,978	10.2	38.5
6. Transportation equipment	235,541	8.3	35.3
7. Building construction	213,743	18.4	74.2

Many other industries, however, depended indirectly, to a greater or less degree, on activity in the building trades.

"Hourly wage rates for union labor in the building trades," says the Department of Labor and Industry, "were cut sharply during the year ending May 15, 1932. Analysis of union agreements shows wage decreases in 1932 for 27 out of 30 building trade occupations, the reductions in many instances dropping to the wage level of 1924. The average union rate for all building trade occupations on May 15, 1932, was \$1.129 an hour as compared with \$1.217 an hour on May 15, 1931, a decrease of \$.088 an hour, or 7.2 per cent."

Approximately 40 per cent of the net building dollar, according to a study made in 1932 by the Bureau of Labor Statistics in Washington, goes for construction labor on the site. This excludes all overhead, profits, land and finance costs,

fees, etc. None of the cities surveyed were in Pennsylvania, but the proportions were constant throughout. For residential construction the proportion was somewhat higher in 1928, approximately 46 per cent, and slightly lower in 1932(37 per cent).

The proportion of construction labor cost in the selling price of a typical small house put up by an operative builder in the 1920's rarely would have amounted to more than 25 per cent. Other things remaining the same, a reduction of 20 per cent in building wages would result in a price-saving of only about 5 per cent.

2. Productive Capacity

An analysis based on actual operations at the hosiery workers' apartments, now nearing completion in Philadelphia, estimates that one construction man, working an average of 24 hours per week, can produce about three rooms per year.

The 214,000 Pennsylvania building trades workers, if working steadily and entirely engaged in residential construction, therefore could erect about 642,000 rooms in a year, or approximately 160,000 small dwellings averaging four rooms each. Since the maximum annual output envisaged in a quantitative program of needs is around 81,000, this would engage only about half of the total available building trades workers and would by no means absorb all the men at present unemployed.

Figures on dwelling units constructed since 1920 are available for the 15 cities of more than 50,000 population, contain-

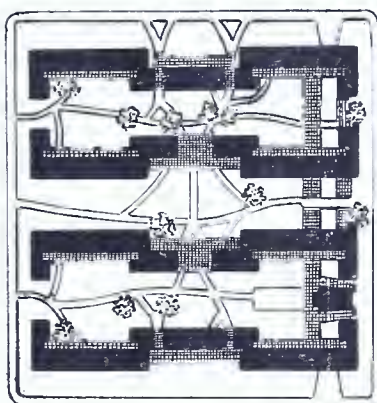
ing 38 per cent of the people of the State.* In the decade 1920

* Bureau of Labor Statistics, U. S. Department of Labor, and Pennsylvania Department of Labor and Industry.



HOSIERY WORKERS' HOUSING:

One of the few limited dividend projects receiving a loan from the PWA, the Carl Mackley Houses in Philadelphia consist of 295 apartments on a $4\frac{1}{2}$ acre block planned with no interior traffic streets.



COAL-MINERS' HOUSING: A company-owned town typical of the 853 villages in the soft-coal region surveyed by the State Department of Health in 1928. Photograph by courtesy of Mr. Howard Bronson, Housing Engineer.

to 1930, 153,459 new family accomodations were erected in these cities, and in 1930 approximately 17 per cent of all the families lived in dwellings put up after 1920. The number of families increased by about 139,255 during the same period. Since the population increase for the State as a whole was proportionally similar, it is fair to assume that the rate of new construction for the State must have been similar. The 15-city rate would, if applied to the State as a whole, have produced about 395,000 new dwellings in Pennsylvania from 1920 through 1929. At this rate the present number of families could be entirely rehoused in about 57 years.

The past four years, 1930-1933, show a different picture. Only 8,484 new units have been put up in the 15 cities, a rate which would produce about 21,800 for the State as a whole.

	Average annual increase in dwelling units, 15 largest cities	Rate per 1000 families
1920-1929	15,346	17.64
1930-1933	2,121	2.44

The annual value of building permits (a rough gauge of net construction costs) in the 10-year period for the 15 largest cities was \$80,129,990. At the same rate, the State as a whole would have spent about \$206,201,740 per year for construction. The value per year in the 1930-1933 period declined to about one-eight of this. Allowing 40 per cent of cost for wages, it is apparent that the money available from residential construction for the annual wages of Pennsylvania's 214,000 construc-

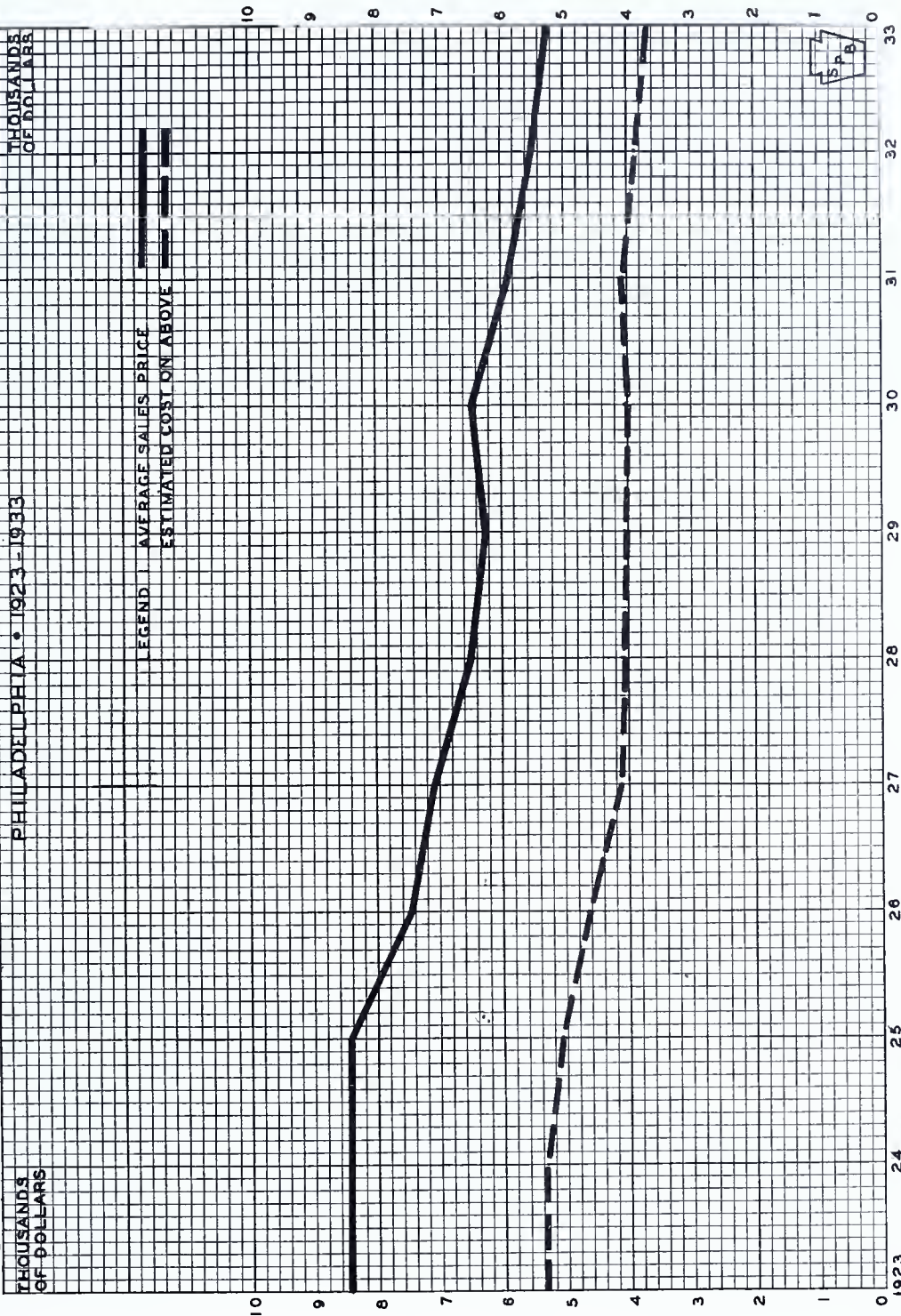
tion workers dropped from an average of about \$82,500,000 in the 1920's to a little more than \$10,000,000 in the 1930's.

Actual productive capacity can be estimated a little more closely. Each of these 15 cities had a peak production year for new dwellings, ranging from 1922 to 1927. Presumably, if Allentown was able to build 814 new homes in 1926, it could be done again. Adding together the dwellings produced in the peak years of all the cities, a total of 25,870 units is the known productive capacity of the 15 communities. Applied to the State as a whole, this rate of dwelling production would result in 66,570 dwellings per year and would rehouse the present number of families in about 34 years. The amortization rate currently in use by the Housing Division of the Public Works Administration is 35 years, and 40 years is estimated by Mr. Newman as the average useful life of a dwelling put up under present conditions.

Large-Scale Methods

Any effective large-scale program of low-cost housing, whether achieved with government intervention or without, would have to take advantage of all possible economics to be derived from large-scale operations and mass-production methods. The interjection of large-scale methods perhaps would constitute a complete revolution. However, it has been many decades since any sizable proportion of new dwellings has been produced individually, or tailor-made for the family intending to occupy them. Ten per cent has been given as a high estimate for the

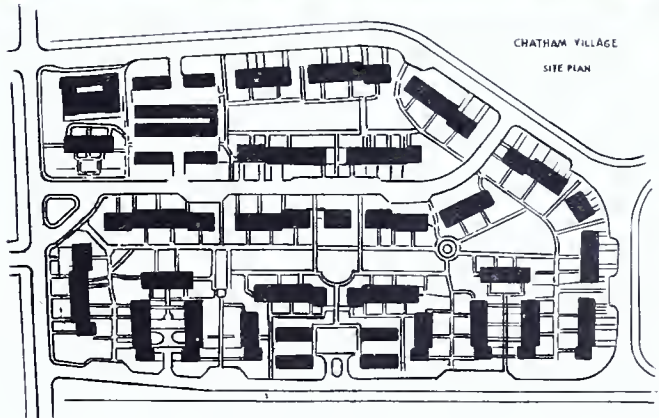
AVERAGE COST & SELLING PRICE OF ONE FAMILY DWELLINGS





CHATHAM VILLAGE:

a neighborhood of row houses put up in 1932 for rent on a limited dividend basis to white collar workers of Pittsburgh, by the Buhl Foundation.



Typical row-houses in Philadelphia, put up by an operative builder for sale. The original cost was probably about the same as for the Chatham Village houses shown above.

number of houses in Philadelphia constructed directly to the order of the occupants. Elsewhere the proportion might be slightly higher, but in any case it would constitute only the houses of the upper-income group. Of the 12,370 home-owners covered in the Intensive Survey of Allegheny County, less than 25 per cent reported that their houses had been built for them.

In Philadelphia operations have been large, usually covering a block at least. In the western section of the State they have tended to be somewhat smaller

PRIVATE ENTERPRISE

1. Normal Costs and Present Needs

Despite various governmental measures intended to prime building business, almost no new dwellings are being constructed.

The average value of residential building permits per dwelling unit in the 15 largest cities since 1920, was as follows:

<u>Year</u>	<u>Average Construction Cost per Dwelling Unit</u>	<u>Year</u>	<u>Average Construction Cost per Dwelling Unit</u>
1920	\$6447	1927	\$4811
1921	5271	1928	4707
1922	4694	1929	4801
1923	5448	1930	4991
1924	5668	1931	4551
1925	5954	1932	4040
1926	4988	1933	3812

An accompanying chart indicates the usual spread between cost as indicated by building permits and selling price in Philadelphia. The increase over cost ranges from 64 per cent in 1925

to 43 per cent in 1933. The spread in certain other cities, notably in Pittsburgh, probably would be relatively greater, due to higher land costs and more bonuses and commissions on second mortgages.

These are only average figures, and a certain number of dwellings were put up which cost substantially less.. The distribution is indicated in a study made by the Philadelphia Housing Association. The proportionate number of new one-family houses selling below \$5000 in Philadelphia has been as follows: 1924 to 1927, 4.0 per cent; 1928, 5.3 per cent; 1929, 13.2 per cent; 1930, 18.9 per cent; 1931, 30.8 per cent; 1932, 65.7 per cent; 1933, 46.1 per cent.

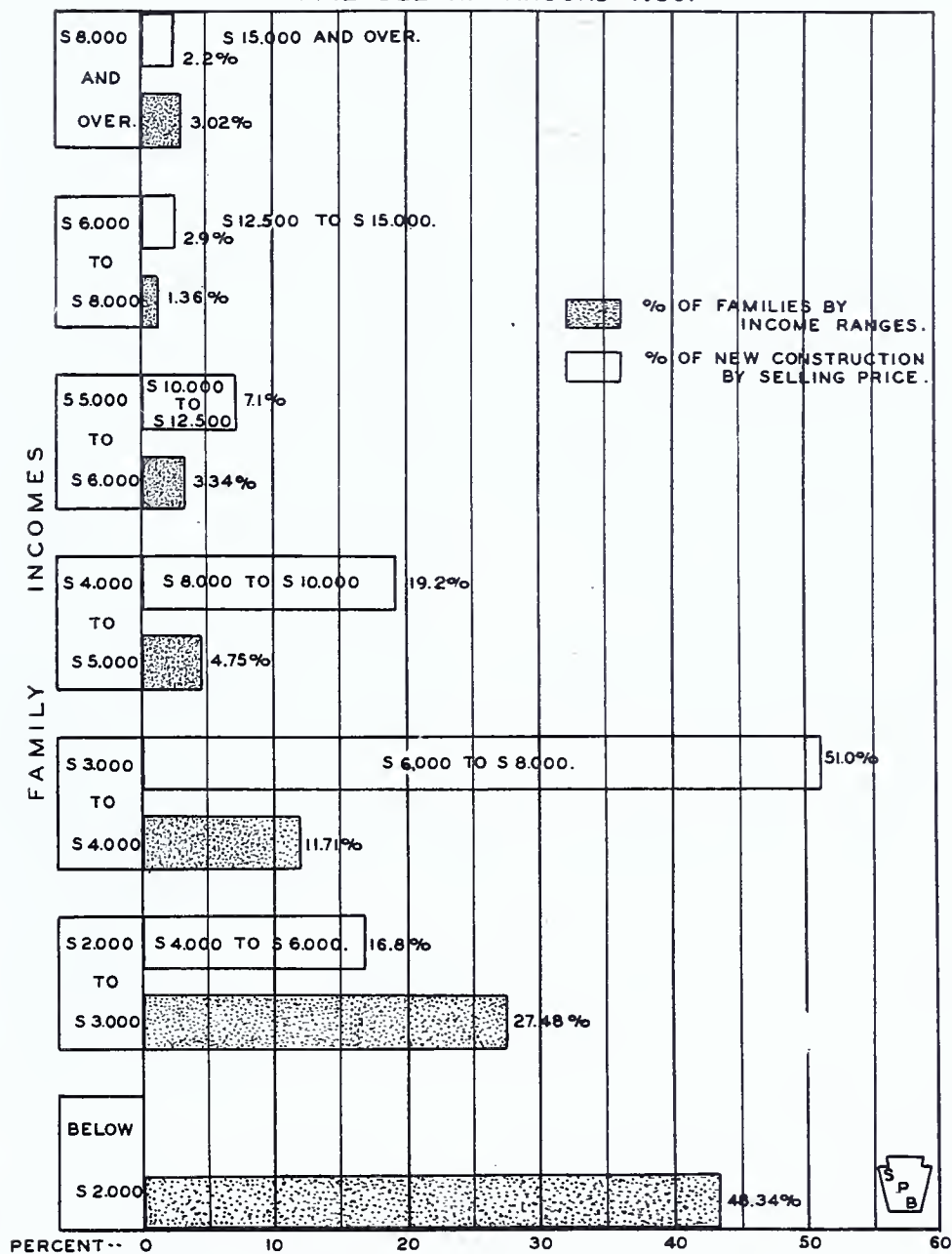
The share of new construction selling under \$5000 would have been considerably less in Pittsburgh and several other cities.

Various authorities, including the Bureau of Standards, say that a \$5000 house, even when financed by the most economical means available, cannot legitimately be paid for except by families with regular annual incomes of between \$2000 and \$3000, the former only in highly exceptional circumstances. And, according to estimates by Dr. Edith Elmer Wood and the authors of "America's Capacity to Consume," only one-third to one-half of American non-farm families had incomes of over \$2000 in 1929. Results of the Allegheny County Survey if applied to the entire State indicate only one out of eight families has an income of \$2000 or over.

That the cost of an average house has more than doubled

NEW BUILDING IN THE WRONG PRICE RANGE

PHILADELPHIA AROUND 1930.



since before the war is partly the result of increased utilities and equipment - bathroom, garages, pipelines, etc., but speculative land prices, expensive construction loans, mortgages, bonuses, fees, commissions, sales and promotion costs and numerous other more or less intangible factors all tended to keep original costs high.

The cost of housing cannot be measured by original price alone. Few people buy houses outright for cash, and they must pay taxes and upkeep. Monthly payments or rents may be high or low in relation to original cost, depending largely on methods of financing. Annual costs to occupants excluding amortization in the case of owners in relation to the original cost range from 6 to 8 per cent on various contemplated governmental projects, to 15 per cent or more for the more speculative type of apartments. The Committee on Large Scale Operations in President Hoover's Conference on Home Building estimated that a decline of 1 per cent in the interest rate alone would reduce rentals by 8 per cent.

1. Home-Ownership and the Financial Interests

The greater part of the energies of private home-building enterprise during the past 15 years has been devoted to the promotion of individual home-ownership. In 1930, 53.6 per cent of Pennsylvania Census families owned their own homes. The rate for the United States as a whole was 46.8 per cent. Pennsylvania, New York, New Jersey, Massachusetts and Rhode Island were the only states which in 1930 showed more than 20 per cent

increase in home-ownership. At the end of December, 1933, according to G. W. Cliffe, Secretary of the Pennsylvania League of Building and Loan Associations, there were in this State 2,948 building and loan associations with outstanding loans of \$957,800,000. A large share of this investment is in individually owned small houses.

The picture is not complete, however, without mention of the rate of foreclosures, particularly in Philadelphia. Houses on sheriff's sale listings, of which more than 90 per cent were actually sold, increased from 5,298 in 1926 to a high mark of 20,823 in 1932, dropping to 19,571 in 1933. The total for eight years was 114,898, or about one-fourth of the residential structures in the city.*

Few of these foreclosures were due to tax delinquencies because of a local law which makes the city assume mortgage obligations in tax foreclosures. "The 3,437 Building and Loan Associations which were operative in Philadelphia in 1925," says the 1933 report of the Philadelphia Housing Association, "had dropped by March, 1934, to 2,256. Of these, 342 were being liquidated, 470 were being operated under restrictions and only 1,444 were active."

The median value of owner-occupied non-farm homes in 1930 was as follows:** State, \$5206; Urban, 5830; Rural non-farm, \$3432.

* Figures from Harry Moul of the Philadelphia Housing Association.

**Figures from U. S. Census.

The range by counties extended from \$1702 in Potter to \$7674 in Delaware. Median values, as estimated by owners in 1930 and 1934, were as follows:*

	<u>1930 Census</u>	<u>1934 (RPI)</u>	<u>Percent Decrease</u>
Allegheny County	\$6658	\$5724	14
Pittsburgh	7058	5725	19
McKeesport	5980	4295	28
Erie	6514	4530	31

The fact that tax assessments have not been greatly reduced and that their monthly payments have not suffered any general reduction, probably has tended to keep home-owners a trifle over-optimistic. Median rentals came down more than 30 per cent in the same areas from 1930 to 1934. On the intensive survey in Allegheny County it was found that the median income of owner-occupant families in 1933 was \$827, but the median estimated value of their homes was \$5,201. Obviously such a situation could not continue indefinitely. These same home-owners, whose median year of home purchase was 1923, estimated the combined market value of their 12,000 homes was now only about 8½ per cent lower than the price paid originally.

Money for new construction by private enterprise must come from the same agencies, practically, which financed construction in the 1920's and which now hold such a large share of that construction in foreclosure. The influence of this fact on the present attitude toward efforts to stimulate new construction cannot be overestimated. The 1933 Report of the
 * Figures from U. S. Census.

Philadelphia Housing Association says:

"The need for more low cost, low renting houses is generally recognised. There is, nevertheless, an effective opposition to their construction. Many corporate owners of dwellings, largely those who acquired title through foreclosure for nonpayment of amortization, interest or taxes, are adversely influencing building programs and this attitude is sustained by mortgage lending agencies who seek a wider margin between the market value of dwellings and the face value of the mortgages they hold thereon."

"Underlying this argument is the belief that corporate owners and mortgage investors are entitled to a monopoly in housing until residential real estate may be sold or rented without a loss on the original investment, and until losses suffered by non-rent payments can be recouped."

"If this policy and the arguments which support it were undebatable, society might well apply the same reasoning to all fields.... and say that "no more automobiles shall be built until all the existing ones are again worth their original purchase price."

"Business recovery will not result from compulsory price raising (i.e. by creating a false scarcity) when opportunities for work are withheld."

The remainder of that report shows how the present impasse is the logical result, not of overproduction or of the depression itself, but of risky loan practices, failure to allow for de-

preciation and obsolescence, the encouragement of "over-building in the wrong price range and overbuying by families of limited resources," and similar conditions.

FEDERAL HOUSING AGENCIES OPERATING IN PENNSYLVANIA

A complete summary of policies and achievements of Federal Housing agencies operating in this State is being prepared. A brief outline follows.

1. Housing Division of the Public Works Administration

One Federal loan to a limited dividend project of 295 apartments for the American Federation of Hosiery Workers - now nearing completion in Philadelphia.

2. Public Works Emergency Housing Corporation

An "allocation" of \$4,000,000 for slum clearance in Philadelphia has been announced, but no site has been selected and no organization set up.

3. Home Owners Loan Corporation

About 30,000 loans amounting to about \$60,000,000. Purely a re-financing agency.

4. Subsistence Homesteads Division

One project nearing completion of 250 homesteads costing \$625,000, nine miles from Greensburg, Westmoreland County, for "stranded" soft-coal miners.

5. Federal Housing Administration

Federal guarantee for an indeterminate but probably not very large number of loans for "modernization and repair" of middle-class homes. No new constructions.

CONCLUSION

A great need in housing is the organization of consumer demand. The experience of all foreign countries has been that low cost housing is not provided in sufficient volume until demand is mobilized by consumer organization and pressure developed to obtain needed action by governmental bodies.

Every encouragement should be given to the formation of groups that will work toward the construction of new housing suited to the needs of those who are now living under sub-standard conditions.

There is at present no legal authority or other public agency in Pennsylvania, either State-wide or local, empowered to cooperate with the Federal Government in housing matters or to initiate low-cost housing projects of its own. It is recommended that legislation be enacted creating a State Housing Authority.

SOCIAL SECURITY*

Among the great challenges to our generation are the contingencies menacing the security of individuals and consequently the social security of the Nation. The problem of how best to meet them is being given profound study by the Federal government. But we, in Pennsylvania, must reach decisions independently on these problems as they touch us.

The need for unemployment insurance and old age pensions in Pennsylvania has frequently been emphasized. This State has adopted certain forms of social insurance, such as Workmen's Compensation legislation, provision for assistance to mothers and pensions for the blind. Do we want further social insurance? Its advocates maintain that its benefits in the preservation of life, reduction of suffering and increase of human welfare far outweigh actuarial difficulties and other objections. Its opponents assert that the present tax burden is as high as can be borne; that no comprehensive plan can meet grave National crises out of the reserves of the past, and, that therefore, in times of stress, we would be forced to draw upon the resources of the future, precisely as the city, county, state and nation have been forced to do in the present emergency. They point out such troublesome questions as the lack of

*In part based on an unpublished report, "Suggestions for a Program of Social Relief and Economic Security in Pennsylvania," by W. C. Plummer, Ph.D., Professor of Economics, University of Pennsylvania, for the State Emergency Relief Board.

data with which to determine the cost of such service with mathematical accuracy and upon which to base rates, and contend that private enterprise is better fitted than governmental agencies to administer such activities. But to these and other objections, the proponents reply: "They are insignificant in comparison with the positive function of social insurance, the certain relief of human suffering."

Assuming that we do decide that further social insurance in Pennsylvania is desirable, should we consider a complete protection program against the loss of a right to earn a living? Should we place our chief emphasis upon unemployment insurance, as President Roosevelt did in his recent address before the Committee on Economic Security? Should we consider sickness and health insurance, old age insurance, maternity benefits, survivors' insurance at this time or wait until the matter of unemployment insurance is settled? Should we have a separate type of insurance for each risk, or consider the possibility of complete coverage? Should we devote our energies to improvement of types of insurance we already have, such as Workmen's Compensation?

Secretary of Labor Perkins, in an introduction to Mr. Abraham Epstein's work, "Insecurity--A Challenge to America," says: "Unemployment, sickness, accident, death and old age manifest themselves in terrible individual experiences, and create social conditions which call for immediate solution. Most European countries have Nation-wide unemployment insur-

ance, medical care provisions and other forms of social insurance. We in America are yet too involved in discussions, in comparisons of different methods, in speculation on possible outcomes, while reality calls for action."

Insurance under private management has sought to provide against some of these contingencies, the State has sought to help individuals face others. Legislative requirements for workmen's compensation, compel insurance to be carried by the State, private companies or authorized self insurers.

The financial situation forced upon many a family by the death of a breadwinner, including dependency of a widow, orphans or others, can be met to a certain extent. The blow can be softened. Similarly we can offer hope to those facing the problems of old age, with its attendant infirmities and lessened capacity for self-care. The same is true in cases of accident, special conditions such as blindness, unemployment, physical and mental sickness, each of which may be regarded as reasonably inevitable for a definite proportion of the population.

The precise time at which any one of these blows may fall is unpredictable. But, by spreading the risk, we can try to protect ourselves. Direct relief measures, pensions and social insurance have been the tools devised to act as cushions to soften the shocks which, experience has shown, will come in numbers that may be estimated with a fair degree of accuracy. However, we must face the fact that none of these methods provides, in itself, a complete cure. Human ingenuity has done

little, except in such fields as accident reduction and preventive medicine, to evolve anything but palliatives.

Unemployment Insurance.

Unemployment insurance, with an attendant payroll tax, is predicted as a part of the Federal Administration program for the coming Congress. President Roosevelt's economic security experts have regarded insurance as the first line of defense against recurring periods of unemployment. But wide diversity of opinion exists on the various details of such insurance, the method of handling it, the length of time that benefits should be paid, the amount of benefits, how funds should be raised.

The President, in his address already referred to, said: "For the administration of insurance benefits, the States are the most logical units...Not only will there have to be a Federal law on unemployment insurance but State laws will also be needed."

In view of this statement, the most careful study possible should be given by Pennsylvania to the drafting of an unemployment bill which will not only meet the needs of the State but fit into the National program adequately. A number of National social insurance schemes of different types have been put into operation in Europe, with varying degrees of success. Some have bogged down because they have been inadequately or inexpertly financed. Experience by the British has tended to prove that governmental operation rather than private administration results in great economy. Investigating committees in

various States have studied the subject and adequate data is available for drafting an immediate plan for Pennsylvania.

Despite the general interest in the subject and the number of bills relating to it which have been introduced in the various state legislatures, Wisconsin alone has enacted an unemployment insurance law so far. The beneficiaries under this plan are industrial workers only. All others and part time workers are excluded. The employees of employers of less than ten persons are excluded, as are workers earning more than \$1,500 a year. Two preceding years residence or forty weeks work in the State is specified, with two weeks work for the specific employer. A worker may be disqualified for "misconduct," quitting "without cause," or not applying for work at prevailing rates. Union standards are not protected.

Much controversy has developed over how long an insured worker should have to wait before participating in benefits. The Wisconsin act specifies two weeks, while others vary from no period of waiting to eight weeks. The length of benefit in Wisconsin is limited to not more than ten weeks in any one year and not more than one week to every four weeks of employment in the previous year. It specifies that benefits shall not be more than \$10 per week or 50 per cent of wages. The minimum is \$5, or less for part time workers. Contributions are made by the employer only; never more than 2 per cent of the payroll and less when the reserve is considered adequate. Individual plant reserves are specified but are held by the State.

Administration is by the State Industrial Commission. The worker must file a claim which the employer may dispute. The employer may set up and administer a private plan if the Commission approves.

A measure similar to the Wagner-Lewis bill, sidetracked at the last session of Congress, may be introduced at the coming session. The bill met that requirement specified by President Roosevelt when he said: "I am still of the opinion that this part of social insurance should be a cooperative Federal-State undertaking." (November 14th address) The income limit was set at \$3,000. Otherwise the provisions concerning beneficiaries were, in general, like those of the Wisconsin act, "approved standards" for State laws having been provided. A 5 per cent tax on employers was suggested as the source of funds, with payments under "approved" State unemployment insurance laws credited. To quote again from the same address by President Roosevelt: "It (unemployment insurance) must be financed by contributions, not taxes." While the contributions of the employer in this instance would be compulsory, experts hold they would not bar the way for a similar measure, as the amount paid by the employer for unemployment insurance under any state plan might be deducted from this tax.

The questions before Pennsylvania, then if the Legislature deems passage of an unemployment measure wise, are: Does the proposed bill provide adequately for cooperation with the Federal measure which seems likely of enactment? Should bene-

ficiaries include all occupations, whether industrial, agricultural, domestic or professional? Should benefits cover all time lost, and if not, how much? What previous residence and employment requirements should be specified? What provisions should be considered for protection against discriminations, for union membership, etc.? Should part time workers be covered? Should trade union wage standards be protected? Should a waiting period be established, or should the insured become eligible to benefits upon loss of employment? What should be the amount of benefit? Should private plans be permitted? How should the administration be cared for? How soon should the benefits begin after passage of the law? How much of the cost of involuntary unemployment should the individual worker and his family bear, either through contributions, waiting periods, limits of amount of benefit (either by proportion of or length of benefit period) security of the fund?

Two of the most controversial points in unemployment insurance discussions have been the period of waiting before receiving benefits and the amount of benefit. In the former, the various plans under consideration in the United States have shown a variation from no waiting period at all to eight weeks. The most liberal proposal suggested that the amount of benefit should be equal to the average local wages, in no case less than \$10 a week, plus \$3 for each dependent. This was incorporated in a bill also introduced in the last Congress. The Wagner-Lewis bill, of especial interest as a possible groundwork

for future measures, specified \$7 a week or twenty hours pay, with liability of the fund at all times to be limited to its resources. The Ohio plan, introduced in the Legislature of that state after long study by an Unemployment Commission, specifies not over \$15 or 50 per cent of wages. The Minnesota plan suggests 40 per cent of wages. The Massachusetts King bill provides not over \$10 a week, or 50 per cent of wages, with rates lowered or stopped when the plant reserve is insufficient. New York's Byrne bill provides for \$5 to \$15 a week, not over 75 per cent of wages. The American Association for Labor Legislation "standard" bill provides for not over \$15 a week or 50 per cent of wages and the American Association for Social Security "standard" bill for not over \$10 or 40 per cent of wages, with a \$2.50 maximum allowance for a wife and \$1.25 for a child, provided the total is not more than \$5.

Two points can be noted in practically all of these plans --the individual worker rather than industry bears the largest share of the burden and in every major crisis, the plans suggested are in essentials only a supplement, not a substitute, for a relief program.

Among the objections raised to social insurance in general and unemployment insurance in particular is the lack of statistics on which to base a rate. Experts have answered that unemployment is a definite economic hazard resulting in measurable economic losses and measurable economic distress.

Another objection has been the "catastrophe hazard" common to all insurance and typified in this instance by the recurrence of depressions which would tend to wipe out reserves. Advocates of unemployment insurance hold that such recurrences may be reckoned with and reserves provided to meet them, whereas in other types periodicity of the catastrophe is not even remotely predictable. For instance, an epidemic might wipe out a great number of lives, a fire or tornado or earthquake might destroy a city. In each case a tremendous load would be thrown unexpectedly on the insurance covering that particular contingency. But the companies have no way of telling whether the next epidemic or fire or tornado or earthquake will follow immediately or many years elapse before the next similar catastrophe.

As for the argument that fraud and malingering would prove an insurmountable handicap, it is pointed out that while these things form dangers present in every kind of risk underwritten, no one advances this as an argument for the abolition of all insurance.

Obviously, the most important immediate step is to reach some measure of agreement among proponents of unemployment insurance. The types advocated may be divided into three main groups, differing chiefly in the manner each attempts to deal with these points: Should legislation impose contributions upon the worker as upon the employer? Should a separate reserve be established for each employer in the State fund or

should all of the reserves be thrown into one single pool?

Should the government contribute to the unemployment reserves?

Should the law be used to prevent unemployment by stabilizing industry or should it be used primarily as a relief measure?

Of the three main proposals, the one that seems to have met with the greatest approval up to the present time is the individual reserve plan for insurance. This proposed method of establishing an adequate fund for unemployment insurance has the endorsement of the American Federation of Labor, the Governor's Interstate Commission appointed by Executives of seven eastern states and the American Association for Labor Legislation. It has been recommended by legislative committees in Massachusetts, California, and other states. Its distinguishing features are: (1) Contributions are made by employers only. (2) Employers' accounts are kept separate, except that two or more employers in the same industry or locality may merge their accounts in a joint account, or may be required to do so by the proper administrative authority if such action is desirable in order to safeguard the reserves or carry out the purposes of the plan. (3) The government does not contribute to the support of the system. (4) The law may be drafted making unemployment reserves or insurance primarily a relief measure, or it may go further and attempt to stabilize industry or regulate employment, as in the case of the Wisconsin law.

The second of the three main plans is that proposed by

the Ohio Commission on Unemployment Insurance. Highlights are:

(1) Contributions are made by both employers and employees.

(2) Reserves go into a state-wide pool. Since benefits are

paid from this central pool, a sharing and distribution of

risk, characteristic of insurance, results. A merit system

providing for the payment of higher premiums by those whose

records show a high rate of unemployment, was recommended by

the Commission. (3) The government does not contribute to

the support of the system. (4) The plan does not purport to

abolish unemployment or to regulate employment; it is primarily

a relief measure.

In Philadelphia, the Permanent Committee on Unemployment

of the Chamber of Commerce has submitted a report in which,

with some variations, it advocates a system of the same gener-

al type as that proposed by the Ohio Commission.

The salient features of the third plan, which is found in

Great Britain and other European countries, are: (1) Contribu-

tions are made by both employers and employees. (2) funds are

kept in a general pool. (3) Government contributes to the

funds. (4) Attempts are made to insure against the hazards of

unemployment, but the plan does not pretend to cure unemploy-

ment nor to stabilize production. While this scheme--the only

one of the three providing for governmental contributions to

the reserves--has been advocated by a number of writers and

students of the subject, it has received little practical sup-

port so far as the best or most expedient plan for enactment

into legislation in this country.

A critical analysis of unemployment insurance which is most illuminating and worthy of attention is that prepared by Kenneth L. M. Pray and published in Survey 69: 155-44, March, 1933. It represents the composite view of an enlightened group of Philadelphians, but is altogether too long for incorporation or even condensation in this report.

Health Insurance.

Two types of sickness insurance have been suggested in the United States. During the period immediately following 1915, bills to provide a substitute for wages lost as a result of sickness were introduced in a number of Legislatures, and committees were appointed in several states to study the project. After the Report of the Committee on the Cost of Medical Care (1932) had been presented, a second campaign was launched, this time urging passage of an insurance law that would cover the cost of medical care. Thus far no action has been taken by any of the States in regard to either proposal. The Board feels that in planning for social security this subject should be considered, and this will be incorporated in the study on Health.

Other Forms of Social Security.

In view of the fact that the trend seems definitely in the direction of categorical insurance, that is, a separate system of insurance for each type of risk, these questions must be answered for the Commonwealth.

What, if anything, should be done about old age pensions?*

What, if anything, should be done about survivors' insurance?

What other subjects should be considered under the heading of shortcomings from the standpoint of complete coverage, such as maternity benefits?

What, if anything, should be done toward the improvement of Pennsylvania's Workmen's Compensation Act?

* See section on "Public Social Welfare" for discussion of old Age Pensions & Mothers' Assistance.

WORKMEN'S COMPENSATION⁽¹⁾

Pennsylvania ranks lowest of all the leading industrial states in liberality of its Workmen's Compensation Act.⁽²⁾ It is twenty-ninth among all the states in maximum amounts paid for total disability; thirty-first in maximum weeks and percentage of wages for total disability and fortieth in maximum amounts paid to widows in fatal cases.

The system has shortcomings from the standpoint of coverage and defects of administration. Passed originally to transfer the cost of industrial accidents in wages lost and in medical care from the worker to industry, it has resulted in the injured worker bearing a very large share of the cost. For partial disability, he received 65 per cent of his wages, provided that does not amount to more than \$15 a week. A minimum of \$7 a week is specified, unless the weekly wage of the worker is less than that sum, in which case full pay is magnanimously provided. But in any event, the injured worker must wait seven days before compensation becomes effective.

The report of the Governor's Committee on Workmen's Compensation contains a severe arraignment of Pennsylvania's workmen's compensation law. Recommendations of the Committee for legislation to strengthen the Act should be given serious consideration.

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- (1) Based on Workmen's Compensation supplement to November, 1934, Bulletin of Pennsylvania Department of Labor and Industry, prepared under supervision of Governor's Committee on Workmen's Compensation.
- (2) Ibid. Graphic section prepared under direction of Advisory Committee on Workmen's Compensation Administration.

Under the provisions of the Act, benefits payable because of permanent disability and death are limited either in the length of time in which they are paid, or in the total amount paid or both. Thus the worker permanently and totally disabled has the benefits of 65 per cent of his wages stopped after 500 weeks, or even before that time if the total exceeds \$6,500. The widow of a worker accidentally killed while on the job loses her benefits after 300 weeks. In view of this, one is justified in asking why permanently disabled workers and their dependents should be thrown upon general relief rather than upon insurance when the State has a workmen's compensation insurance system that might continue to take care of them, at least for a longer period than at present.

The present law likewise makes no provisions for medical treatment beyond the first thirty days of disability and thus works a hardship upon the worker who suffers a serious injury. In some cases employers or insurance companies assume responsibility for treatment after the thirty-day period, hoping thereby to reduce the period or the amount of disability. In others, the victim must assume the burden and pay for medical treatment out of his compensation allowance. This is particularly true in cases involving the loss of a foot, a hand or a finger, for which the employer or his insurance company is required to pay compensation for a definite number of weeks.

The thirty-day limitation also works an injustice to hospitals, doctors and others. State-owned hospitals are among

those penalized. For instance, in the Ashland State Hospital the cost of services beyond the thirty-day limit for 279 cases was \$51,821. In addition, the Pennsylvania Act places a \$100 limit on surgical and medical services, medicines and supplies. In twenty-three of the states and in Federal compensation jurisdictions no such limit has been established, either in time or money.

Since its original enactment twenty years ago, various liberalizing amendments have been added to the Pennsylvania measure and attempts have been made to liberalize it further. Bills of this sort were introduced in the extra session of 1933, but failed of enactment.

The Act lacks provision for occupational disease compensation. In future legislation seeking to rectify this palpable injustice to the worker, consideration should be given to a report to Governor Pinchot on "Occupational Disease Compensation" made in 1933 by the Pennsylvania Commission on Compensation for Occupational Disease. Consideration also should be given to the forthcoming report of the United States Health Service on Silicosis in Pennsylvania Anthracite Mines.

PUBLIC WORKS*

Long Range Planning

Paralleling closely other activities looking toward a greater social security are the planned programs for public works. Possibly these could be made, if properly-timed, an effective pump-priming device to start private industry on its way out of a cyclical depression. Although some economists have cast doubt upon its value as a business stabilizer, all available evidence points to the conclusion that long-range planning could be made a strong and significant, although not major, device for the alleviation of periodical unemployment.

For Pennsylvania, the probable result of successful long-range planning of both State and local public projects would be an additional public works payroll of approximately \$30,000,000 per year for a four-year depression period. The accompanying table contains available data on public construction expenditures by the State and most of its political subdivisions during recent years.

Unfortunately these data are only roughly accurate and include neither all subdivisions nor all work done by the State or any one subdivision. But allowing for a reasonable correction for omissions, it is roughly accurate to estimate that the normal total construction expenditures of the State and local

*Condensation of a report of W. N. Loucks, Ph.D., Assistant Professor of Economics, University of Pennsylvania, to Mr. Eric H. Biddle, Executive Director, State Emergency Relief Board.

governments prior to the depression were approximately \$100,000,000 annually. Probably about one-half of this sum represents expenditures which must be made at a time dictated by factors wholly unrelated to the state of private business activity. For instance, if a sewer caves in it must be rebuilt immediately, or if a hard winter does extensive damage to roads they must be repaired during the following spring and summer.

However, the assumption that, from the standpoint of the physical necessity of the work, about one-half of these total expenditures could be shifted to other years than those in which they actually are undertaken seems reasonable in view of the extent to which the present lack of funds has retarded construction projects.

If the shiftable projects (about one-half of the total) were actually postponed over a seven-year period it would mean the accumulation of projects totaling \$350,000,000. Were the prosecution of these projects to be spread evenly over a four-year depression period the result would be an annual program of \$87,000,000, of which roughly one-third would go for wages.

Pennsylvania's past experience with public works expenditures closely parallels that of all other States. State and local public construction activity, far from being stabilized, has followed closely the swing of private business activity. Prodigious spending during years of prosperity has been followed by drastic curtailments during depressions.

Expenditures by the Department of Property and Supplies fell from \$8,000,000 in 1929 to one-twentieth of that sum in 1934. On the other hand expenditures by the Department of Highways were kept on a somewhat even keel by the increasing liberality of the Federal government which gradually increased its contributions from \$4,000,000 in 1929 to \$13,000,000 in 1934. In Philadelphia expenditures declined even before the depression began, while they were cut more than half from 1930 to 1932. In Pittsburgh expenditures were cut by one-half from 1929 to 1931, and by more than three-quarters from 1929 to 1933. Other political subdivisions have reduced their expenditures by approximately two-thirds since the industrial slump began.

With the deepening of the depression in 1930-1932 governments were put under pressure to create employment by reversing the downward trend of their public works expenditures. But it was only in 1933 after the National administration opened its purse strings to State and Local governments that any expansion of public works and related expenditures occurred. Pennsylvania shared with other states the promotion of CWA and LWD programs. These programs were hastily concocted and have come to be closely tied in with the granting of relief. But care must be used not to confuse them with long range planning of public works for employment stabilization, for the two have practically nothing in common.

Following the lead of the Federal government, a few

States, including Pennsylvania, have considered long-range planning legislation. These proposed state laws and the widespread endorsement they have received forecast important legislative developments in this field when many of the state legislatures convene in 1935.

Two bills (the first Sterling Bill and the Harmuth Bill) were introduced in the Legislature during the 1933 regular session. A third bill (the second Sterling Bill) was introduced during the 1935 extra session. The first measure passed the House and Senate without a dissenting vote, but was vetoed by Governor Pinchot on the grounds that it carried no appropriation and that sufficient State revenue was not available to meet this liability. The Harmuth Bill, which passed both houses, was also vetoed by the Governor on the same grounds. The second Sterling Bill was not reported out of Committee to which it was referred. Both Sterling bills provided for the appointment of a State Public Works Planning Board. The first bill proposed a board of nine, five members to be appointed by the Governor for six years, with the Secretary of Property and Supplies, the Secretary of Highways, the Secretary of Internal Affairs and the Budget Secretary as ex-officio members. The second bill provided for a board of eight members, six to be appointed, with the Secretary of Property and Supplies as ex-officio member.

Both measures authorized the Board to formulate a six-year public works program, to be extended each year. The Board

also would serve in an advisory capacity to governmental agencies. The second Sterling Bill eliminated some of the discretionary powers granted under the first measure. Both bills provided for full cooperation with the Federal Government. These measures probably will be used as the basis for any State Public Works Planning legislation that may be enacted.

However, neither of the Sterling Bills nor the Harmuth Bill have touched upon a question that often has been posed by students and advocates of long-range planning: Does the fact that the State finances its construction work from revenues obviate the possibility of building up reserves of public works projects?

If a solution is to be found to this problem it probably will have to be through a constitutional amendment authorizing a large loan to be issued when the Governor, the General Assembly, a Public Works Planning Board, some Federal agency, or some combination of two or more of these, declares an unemployment emergency to exist. The amount of such a bond issue would be dictated by the probable size of the reserve of projects, and sinking fund payments would have to be so planned as to repay the loan within a relatively short period of years. This would mean that some of the revenues now going into year-by-year State construction work would, after this system is in operation, go into a sinking fund to pay off a bond issue, the proceeds of which had been spent in a concentrated manner on a

depression program of public works. Obviously, this suggestion does not solve all the problems involved, and is merely presented here as suggestive of the general direction in which solutions probably will have to go.

Another important question must be considered: Will the departments of the State government, the General Assembly and the Governor be willing to yield certain powers of timing State construction to a planning board?

The timing of projects obviously is the essence of the long-range public works planning idea, as all preparatory work becomes useless unless those agencies now dictating the timing forfeit at least a portion of that power to some technical agency established specifically for that purpose and successfully isolated from political pressure.

If the agency established to administer long-range planning machinery is merely given advisory powers, then it becomes a question of whether those agencies which retain the actual power to time projects will make their own decisions coincide with the advisory opinions.

Should proposed legislation create detailed machinery and procedure for long-range planning, or should it merely commit the State to the principle and create a commission to recommend further legislation?

It may be argued that if the machinery and modus operandi are not created during the present emergency they will not be established later; that the need which is obvious now will be

speedily forgotten with the return to normal conditions. On the other hand, it may be contended that machinery now established could not begin to function until the depression has passed and that the intervening time should be used to study the basic problems involved so that the best possible legislation will result.

Important problems also arise from the issue of "home rule" is the planning of local government projects. If local governments are given broad powers to do their own long-range planning it is probable that on the whole it will be done less efficiently than if it were done by a State board. Although a good case can be made out for State control on the basis of relative efficiency, the strength of the "home rule" movement creates a practical political question that is not easy to overcome. Moreover, through its representatives in the Legislature, local governments can exercise great power to resist State encroachment on their authority. The two Sterling Bills touch upon this issue, although neither offers a concrete solution.

In vetoing the first Sterling Bill Governor Pinchot called attention to the difficulties involved in laying out a six-year plan for roads and highways; but it seems clear that recent attempts in city and regional planning have been on the whole successful, proving the possibility of doing this sort of work.

The "Ten-year Building Program for State Institutions," formulated by the Department of Welfare in 1927 may be cited as

BUILDINGS NEEDED AT STATE WELFARE INSTITUTIONS

Applications by Commonwealth of Pennsylvania for Loans from the Federal
Emergency Relief Administration of Public Works

Emergency Relief Administration of Public Works				
Location	Project	Beds		Amount
		In- mates	Attend- ants	
MENTAL HOSPITALS				
Allentown, Lehigh County	Dining Hall & Employees' Building	...	10	\$80,500
	Convalescent Building.....	56	..	142,000
Danville, Montour County	Wing Addition & Roof Garden, Clinic			
	Diagnostic Building.....	14	2	50,000
	Pathological Building Addition	..	..	50,000
	Water Filtration Plant.....	..	..	60,000
Farview, Waymart, Wayne County.....	Hospital for convict & criminal in- sane, Guard's Dormitory.....	..	58	150,000
Harrisburg, Dauphin County.....	Laundry Building.....	..	..	150,000
	Two Tuberculosis Pavilions.....	100	..	177,749
	Cottage for Contagious Diseases..	12	..	30,544
Norristown, Montgomery County.....	Reconstruction-Buildings 1,8,13,14	966	..	842,708
	Construction-two buildings for dis- turbed patients male & female	720	..	1,221,120
	Improvements, new floors, heating, lighting, wiring, water, refrigera- tion.....	..	..	402,205
Torrance, Westmoreland County.....	Dining Hall & Kitchen.....	..	..	208,618
	Infirmory Patients' Ward.....	362	9	419,677
	Additions to Dibert Cottages.....	124	..	330,038
Warren, Warren County.	Building for Disturbed Women & Laundry.....	250	..	321,672
	Ward Building for Infirm Female Patients.....	82	..	143,734
Wernersville, Berks County	Kitchen for main Dining Room & a Bakery.....	..	..	100,000

Location	Project	Beds		Amount
		In- mates	Attend- ante	
INSTITUTIONS FOR MENTAL DEFECTIVES AND EPILEPTIC COLONY				
Camp Hill, R.D.1, Cumberland County.....	Cumberland Valley, Insitution for Mental Defectives - to begin con- struction.....	300	20	1,559,500
Laurelton, Union County	Village for feeble - minded women Two Cottages.....	172	26	153,200
	Administiration Building.....	...	16	144,000
Pennhurst, Chester County	School for mental defectives Boiler Plant.....	...	..	100,000
	Two Ward Buildings.....	352	..	535,500
Polk, Venango County.....	School for mental defectives Girls Infirmary.....	240	27	450,000
	Sewage Disposal Plant & Improve- ments.....	...	..	70,000
Selinsgrove, Snyder County	Admission Building.....	104	28	371,205
	Service Building.....	...	..	175,615
	Water System.....	...	..	50,000
MEDICAL AND SURGICAL HOSPITALS				
Blossburg, Tioga County...	State Hospital, Central Unit.....	12	4	96,000
Connellsville, Fayette County.....	State Hospital, Carage & Laundry..	...	4	45,000
Nanticoke, Luzerne County	State Hoepital, New Wing.....	36	..	150,000
Phillipsburg, Centra County.....	State Hospital Addition.....	46	..	120,000
Scranton, Lackawanna County.....	State Hoepital, Extension & Altera- tione.....	325	26	588,000
PENAL AND CORRECTIONAL INSTITUTIONS				
Rockview, Centre County...	Western State Penitentiary, Comple- tion of Cell Block.....	254	..	237,600
Morganza, Waehington County.....	School for Delinquents, Two Cottages	66	6	145,000
Muncy, Lycoming County....	Industrial Home for Women, Canning Building.....	..	..	34,000
	TOTAL.....	4,593	236	\$9,905,185

an example of long-range planning. It has since been modified to meet changing conditions and demonstrates the possibility of getting flexibility into a long-range plan.

THE RELATION OF HOUSING TO ECONOMIC SECURITY*

The particular place of housing in a program for economic security may be discussed from many viewpoints. In many respects a large-scale program of planned public works construction centering around low-cost housing would provide a logical, even necessary, corollary to any program of social insurance. This is a case where a certain amount of positive, constructive prevention may well in the long run not only make the cure less expensive and surer, but even limit the extent of the disease.

Some of the main points of contact between a housing program and the problem of economic security are listed below:

1. Planned construction of housing facilities offers a valuable means of stabilizing employment. By tempering extremes of depression and unemployment in the building industry it provides a particularly constructive form of insurance or guarantee of any measure designed to give cash insurance to the unemployed.

2. It offers a means of raising the material standards of the lower income groups, by the establishment of a "national minimum" below which no family's shelter should be allowed to fall. Whether by outright subsidy or merely by setting up methods of construction, finance and administration whereby the

* Prepared by Catherine K. Bauer, author of "Modern Housing."

rent dollar pays for actual value received in labor and materials (and not, as at present, largely for speculative financing and land costs), an effective low-cost housing program provides the means of raising average consuming power and average real wages.

3. Economic security for an individual family should certainly include reasonable security of tenure in a decent dwelling. This can be achieved only if there is careful coordination of a long-time housing program with social insurance and with other measures such as minimum wage legislation, etc. An extreme example of what happens when these matters are not coordinated is visible in the present situation with regard to "rent relief." In many localities cash rents are paid to families on relief lists. Relief families have in many cases been forced back into slum areas which were formerly half-empty. Therefore, rent relief, often a very large sum in toto, acts as an outright subsidy to the worst slum real estate properties, artificially keeping their value up beyond any possibility of economical slum-clearance.

This discussion of the essential relationship which exists between housing and the general problem of economic security is based on the following assumptions:

A. That present housing conditions in this country and State are, particularly for the lower income groups, well below any acceptable standard of decency or adequacy, and are not compatible with the resources and knowledge of this country.

B. That ordinary private enterprise has not in the past, and is not likely in the future, to be able to solve the problem of housing the lower income groups.

C. That public or semi-public measures must be devised for the effective solution of the housing problem.

The foregoing is treated in detail in the section of this report which deals with housing.

ESTIMATED EXPENDITURES ON PUBLIC WORKS BY THE STATE OF PENNSYLVANIA AND ITS POLITICAL SUBDIVISIONS

STATE DEPTS. DOING BULK OF CONSTRUCTION WORK				POLITICAL SUBDIVISIONS			
Department of Property and Supplies (1)	Department of Highways (2)	Total State Departments	City of Philadelphia (3)	City and School District of Pittsburgh (4)	Other Political Subdivisions (5)	Total Political Subdivisions	Grand Total
1919			\$4,311,464.33	\$1,473,622.94			
1920			8,584,006.86	2,968,197.91			
1921			15,558,437.35	3,523,620.06			
1922			19,858,560.25	5,415,978.93			
1923	\$19,364,552.81		9,336,161.31	5,123,484.42			
1924	39,321,741.00		18,661,963.35	5,161,883.33			
1925	46,328,655.65		57,196,992.67	3,961,003.81			
1926	32,875,859.97		55,187,361.19	6,105,100.00			
1927	29,086,601.27		44,050,298.39	8,257,629.82			
1928	(6) 8,047,732.84		32,559,565.78	9,703,127.10	\$26,242,750.00	\$66,505,442.88	
1929	\$8,548,370.50	\$43,508,181.86	24,428,999.30	8,978,142.06	21,680,950.00	55,088,091.36	\$98,596,273.22
1930	8,548,370.50	46,192,618.29	32,044,681.62	5,270,815.02	30,164,649.39	67,930,146.03	122,671,134.82
1931	3,967,264.50	67,221,429.81	31,182,925.76	4,130,139.44	18,713,549.04	54,026,614.24	125,215,308.55
1932	3,967,264.50	46,872,626.83	12,458,288.52	4,219,214.27	13,995,607.50	30,673,110.29	81,313,001.82
1933	417,190.50	47,709,519.61	48,126,710.11	1,680,563.56	8,154,300.00		
1934	417,190.50	45,036,069.93	45,453,260.43		(7) 12,019,050.50		

DESCRIPTION

- (1) Expenditures for contracted building and construction by the Department of Property and Supplies from appropriations made to them. Biennial figures are arbitrarily divided into annual figures. Previous to 1929 each Department did its own construction work. Source: Information supplied by Department of Property and Supplies.
- (2) Expenditures of State and Federal funds by the Department of Highways on construction, reconstruction, repair and maintenance of highways, roads, streets, bridges, etc., 1923-1927, by calendar years; 1928, January 1 to May 31; 1929-1934 by fiscal years. Of these amounts the following were Federal funds: 1923, \$1,383,649.88; 1924, \$5,288,873.91; 1925, \$5,166,438.25; 1926, \$2,430,608.95; 1927, \$3,569,471.19; 1928, \$857,508.95; 1929, \$3,955,726.71; 1930, \$3,749,222.09; 1931, \$6,176,711.53; 1932, \$9,481,226.97; 1933, \$5,671,440.37; 1934, \$12,925,696.22. Source: Based upon information supplied by the Department of Highways.
- (3) Expenditures of loan funds for permanent public improvements. Expenditures of the School District of Philadelphia are not included. 1919-1928, expenditures for land acquisition are excluded; 1928-1932 some expenditures for land acquisition are included. Source: 1919-1928, W. N. Loucks. The Stabilization of Employment in Philadelphia; 1929-1932, calculated from Philadelphia City Controller's Report.
- (4) Expenditures for permanent public improvements other than the acquisition of land. Expenditures of the County of Allegheny are not included. Source: 1919-1931, manuscript of T. J. Mills and W. F. Alster, the Stabilization of Employment in Pittsburgh; 1932-1933, calculated from Pittsburgh City and School District Controller's Reports.
- (5) Expenditures estimated by taking 50 per cent of the amounts of bonds issued by the following subdivisions: Cities (except the first end second class cities of Philadelphia, Pittsburgh and Scranton), boroughs, borough school districts, city school districts, counties, townships, township school districts, independent school districts. Source: Information on bonds issued supplied by the Bureau of Municipal Affairs, Department of Internal Affairs.
- (6) January 1 to May 31.
- (7) January 1 to May 31. This figure was strongly influenced by the recent grant of power to subdivisions to borrow against unpaid taxes.

Pennsylvania ranks as the second manufacturing state. It employs more wage earners than Massachusetts, Connecticut, Rhode Island, and New Hampshire combined, according to the Census of Manufactures in 1931. In the 14,774 establishments reported in that year, more than 778,700 men and women were on the pay-rolls.

The value of its manufactured products totaled \$4,105,387,000 or almost 10 per cent of the aggregate value produced in the nation in 1931. Production reached its peak in 1929, with a value of \$7,443,861,000, or more than 80 per cent greater than the 1931 total. Manufactured products amounted to \$780 per capita in 1929 compared with \$580 for the whole of the country. These values dropped in 1931 to \$423 per capita in Pennsylvania, and to \$333 for the United States; a decrease for the State of nearly 46 per cent, and for the country of almost 43 per cent.**

Wages paid by manufacturing industries in Pennsylvania in 1931 totaled \$845,607,000, nearly 12 per cent of the total manufacturing wage payment of the country in that year, but a

* See Section on Mineral Resources

** While current figures are available, it was felt that undue emphasis on depression years would present a distorted picture of conditions. Hence the Census of Manufactures for 1929 and advance sheets for 1931 have been used.

decrease from the State's 1929 peak of nearly 39 per cent. The average wage paid in 1929 was \$1,360, and in 1931, \$1,089.

GROWTH OF MANUFACTURING

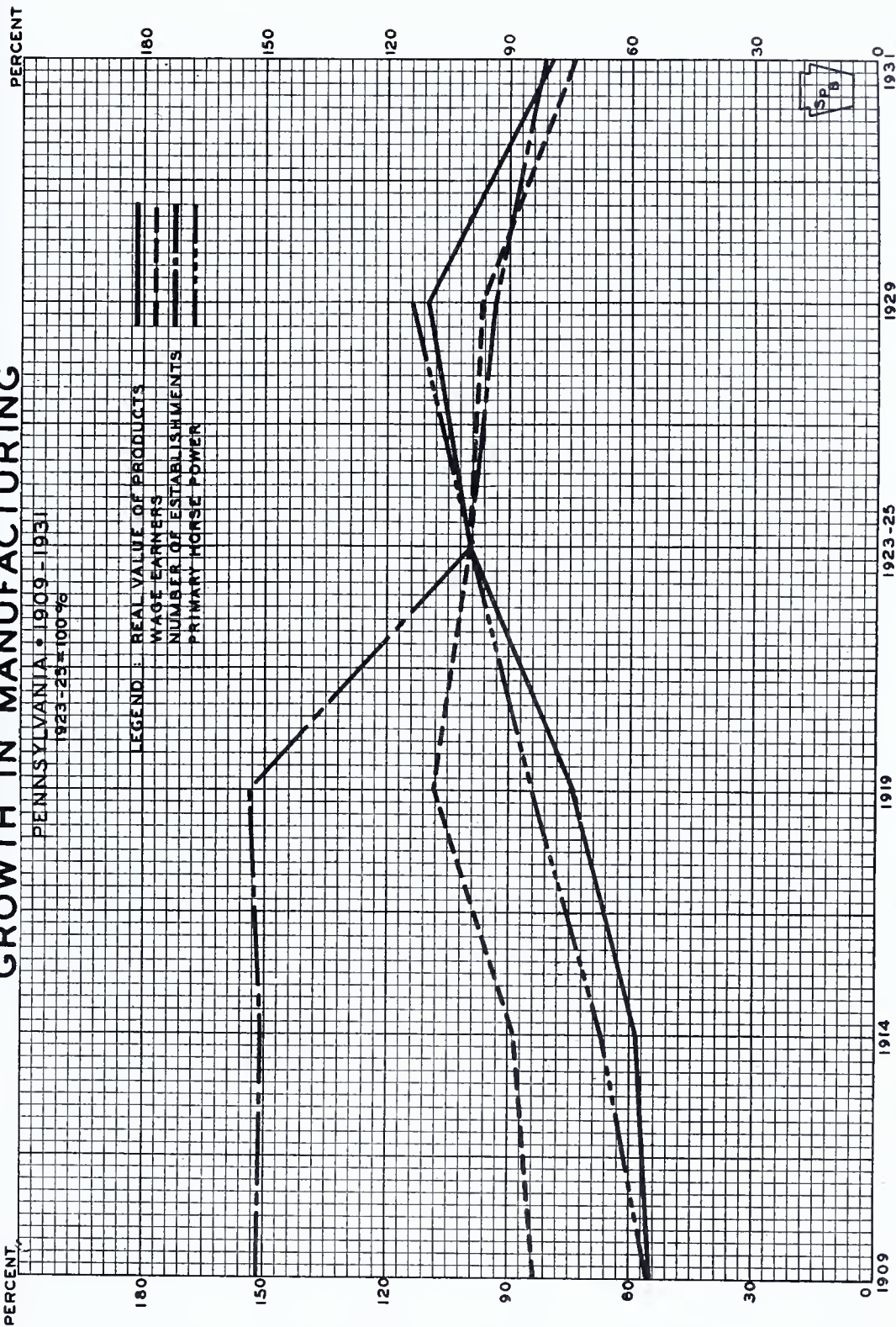
The population of Pennsylvania increased from 1910 to 1920 approximately 14 per cent; from 1910 to 1930 nearly 26 per cent. Compared with this growth the value of manufactured products gained 178 per cent in the first decade, and from the beginning to the close of the twenty-year period, 183 per cent. It must be noted that the State enjoys a constant but relatively low rate of population increase, whereas the value of its products had almost a two-fold gain in the first ten years. and an increase of less than two per cent in the latter decade. Undoubtedly the phenomenal gain in the first period was a result of the stimulation of war activity, yet the productivity provoked by that stimulation was maintained and slightly increased in the closing period.

The growth of manufacturing in Pennsylvania has not kept pace with the United States as a whole. The indices of Pennsylvania's Real Value of Products* were consistently greater than those for the Nation up to 1929, when those of the country forged ahead. The index of production for the State reached its peak in 1929 at 110 (1923-25 equals 100), while in the same year the index for the country stood at 121. A comparison of

* Real Value of Products is determined by dividing the index of value of products in dollars by the index of wholesale prices.

GROWTH IN MANUFACTURING

PENNSYLVANIA • 1909 - 1931
1923=25=100%



ADAPTED FROM CENSUS OF MANUFACTURERS

FIGURE NO. 88

the trends of both State and Nation shows that the latter's rate of increase is slightly in excess of that for Pennsylvania.

ACTUAL AND REAL VALUE OF MANUFACTURES
1909 - 1931

Index of Change - 1923-25=100

Year	<u>* Value of Products</u>			
	Current Dollars		Common Dollars	
	Penna.	U. S.	Penna	U. S.
1909	36.8	33.2	54.9	49.5
1914	39.6	38.9	58.6	57.5
1919	102.4	100.7	74.5	73.2
1923-5	100.0	100.0	100.0	100.0
1929	104.0	114.1	109.9	120.9
1931	57.5	67.1	39.6	92.7

A further indication of this is revealed by the State's constantly decreasing percentage of the nation's total value of products. The Census of Manufactures in 1909 credits Pennsylvania with almost 13 per cent of the United States total. In each census since, the percentage has declined slightly, until in 1931 it was scarcely 10 per cent.

Manufacturing in Pennsylvania may be summed up briefly as follows: The number of establishments is steadily declining, indicating a tendency toward centralization in larger plants. The number of wage earners shows a tendency to stabilize. The

* Current Dollars are those in actual use; Common Dollars are those so adjusted that they will buy the same amount of goods at any period.

number of primary horse-power was gaining rapidly up until 1929, although the real value of products per horsepower from 1923-25 to 1929 decreased; the value of products was rising consistently up to 1929. These tendencies are shown in the accompanying charts.

To assume that the trends indicated will continue at the rate shown in the charts might not be considered entirely unreasonable. Yet to believe that such prodigious gains will be made within the next ten years, as the projection of these trends would indicate, is unlikely.

To qualify these with a bit of conservatism, the trends of the real value of products from 1909 to 1929 and from 1909 to the estimated point for 1934 were compared. The average of their spread when extended to 1944 was considered to approximate the real value of products in Pennsylvania in that year.

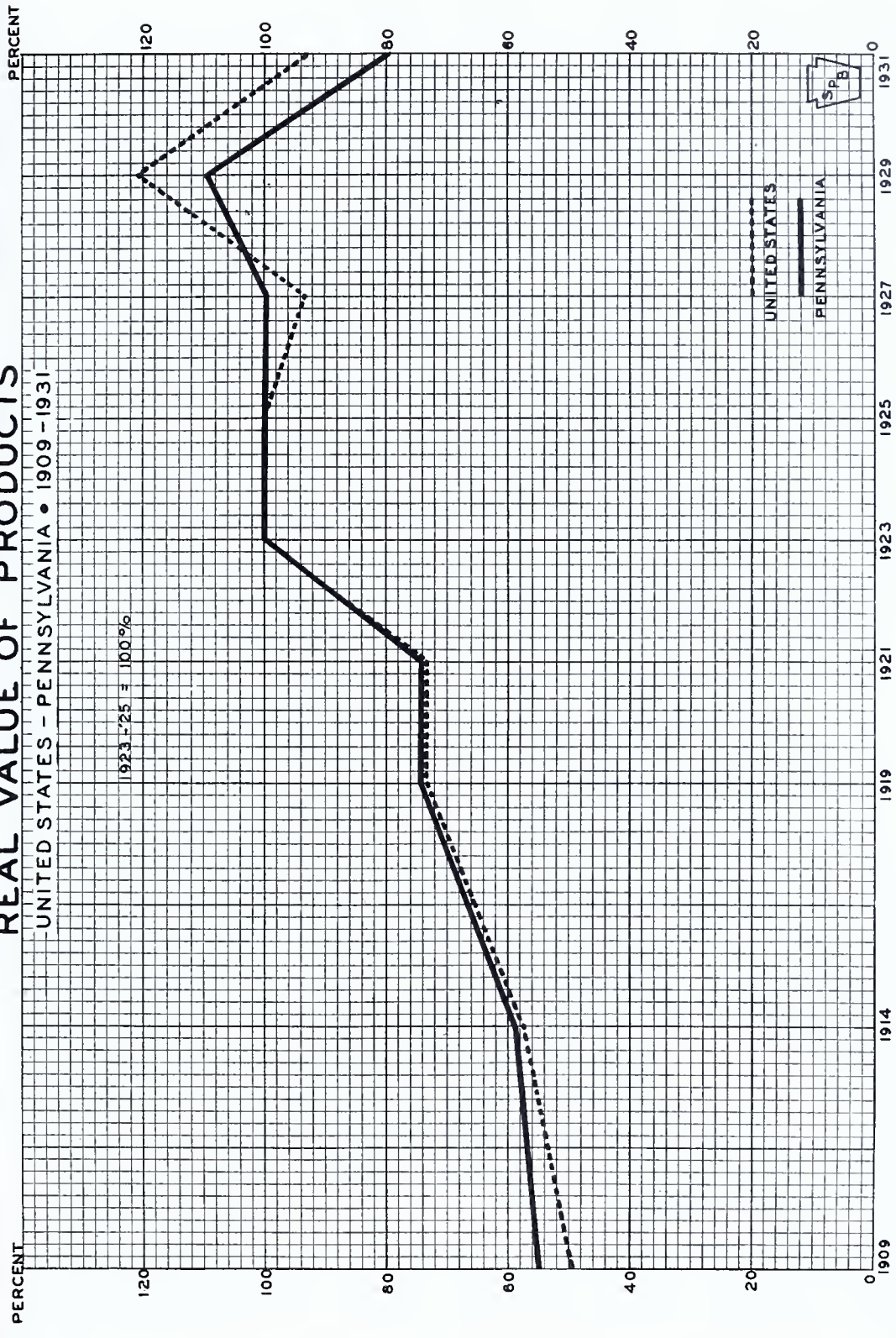
With this figure placed at nine billion, there is an increase over the 1929 peak of 14 per cent. Since the real value of products is a measure of production in dollars of the same buying power, it may be assumed that production in 1944 will be approximately 14 per cent greater than the 1929 volume.

However, it is well to bear in mind that these figures are only estimates, based on the broad assumption that there will be no radical changes in our economy in the intervening period, that there will be gradual increases in manufacturing productivity as human needs develop a greater demand for consumer goods. At the same time there may occur a revolutionary

REAL VALUE OF PRODUCTS

UNITED STATES - PENNSYLVANIA • 1909 - 1931

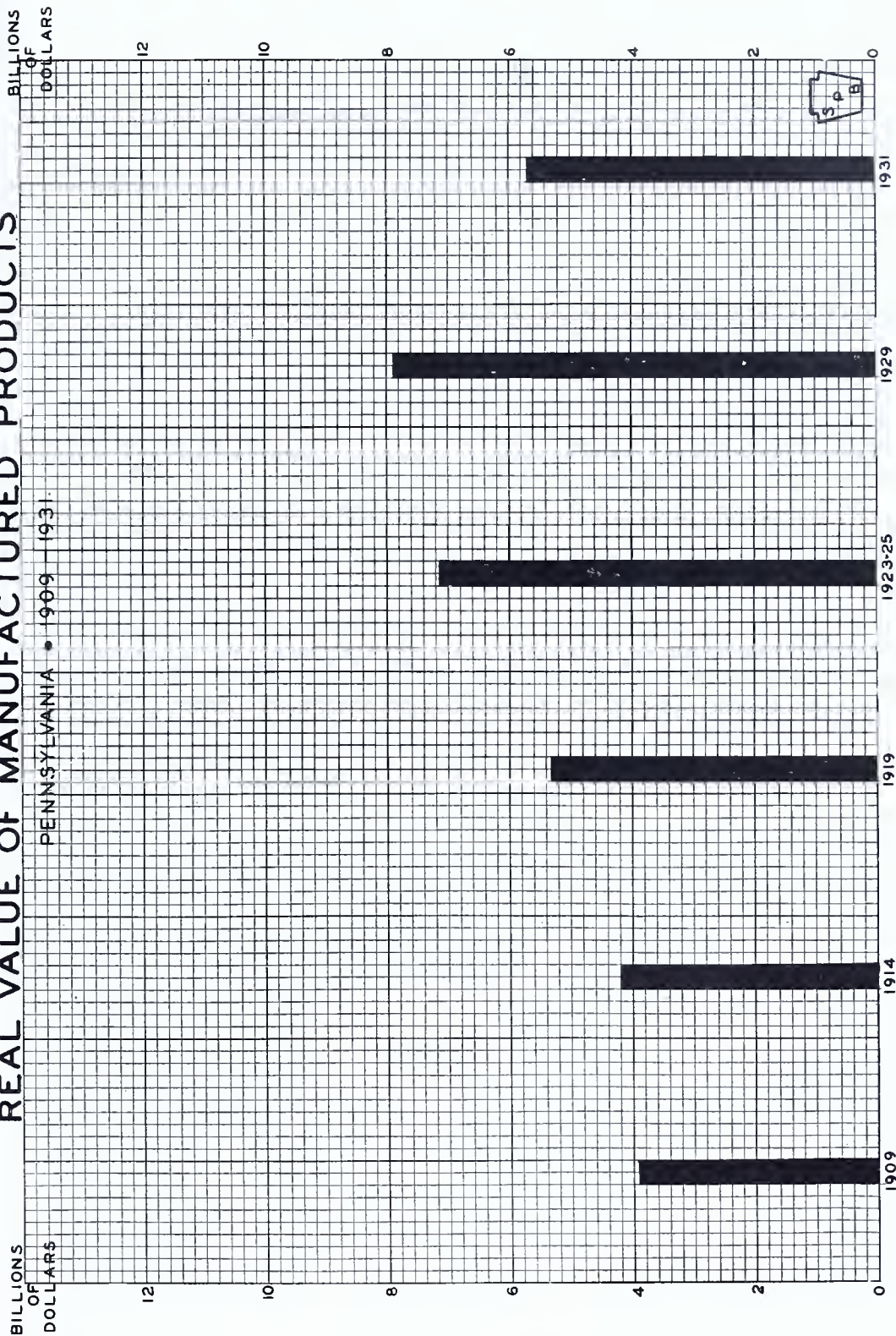
1923-'25 = 100%



ADAPTED FROM CENSUS OF MANUFACTURERS

FIGURE NO. 89

REAL VALUE OF MANUFACTURED PRODUCTS



ADAPTED FROM CENSUS OF MANUFACTURES.

FIGURE NO. 90

change in mechanization or in the development of mechanical processes of manufacture, sufficient to disjoint the whole picture. War or other international complications may have a similar effect.

The number of wage earners required to attain this increased volume of production will be approximately 1,050,000, or less than 4 per cent more than were employed in 1929. This number is derived by using the real value of products per wage earner as a guide. This factor closely paralleled the real value of products from 1919 to 1929. In anticipation of an increase in mechanization, this was increased over the 1929 amount by slightly more than 10 per cent, fixing the 1944 figure (real value of products per wage earner) at \$8,600.

A similar analysis of the number of primary horse power required shows that there will be but a slight increase over the 1929 figure. The real value of products per horse power declined from 1923-25 almost 4 per cent, indicative of a tendency to stabilize at the present level. This means only that the primary installations of the present, or their equivalent, have reached a limit; motors running on purchased electric current will supplant the prime mover to a larger degree. These estimates, compared with the 1929 data, are shown in the following table:

ESTIMATED GROWTH OF MANUFACTURING
COMPARED WITH 1929

	1929	1944
Real Value of Products	\$7,860,000,000	9,000,000,000
Number of Wage Earners	1,014,000	1,050,000
Primary horse power	5,991,000	6,000,000

WAGE EARNERS AND PRODUCTIVITY IN MANUFACTURING

Pennsylvania has consistently employed more than one-ninth of the wage earners engaged in manufacturing in the United States. In 1909, industry reported 877,543 wage earners, 13.5 per cent of the U. S. total. The peak was reached in 1919 with a total of 1,135,837 wage earners, 12.6 per cent of the U. S. total. Since 1919, the decline in the percentage of the U. S. total has been constant except for the years 1923 and 1931: in 1921 Pennsylvania reported 12.4 per cent of the country's wage earners, and in 1923, 12.5 per cent; in 1929 the percentage was 11.5, and in 1931, 11.9. The decrease in the number reported in 1931 compared with 1929 amounted to 235,311 wage earners. The number of wage earners for the several years is shown on the accompanying chart.

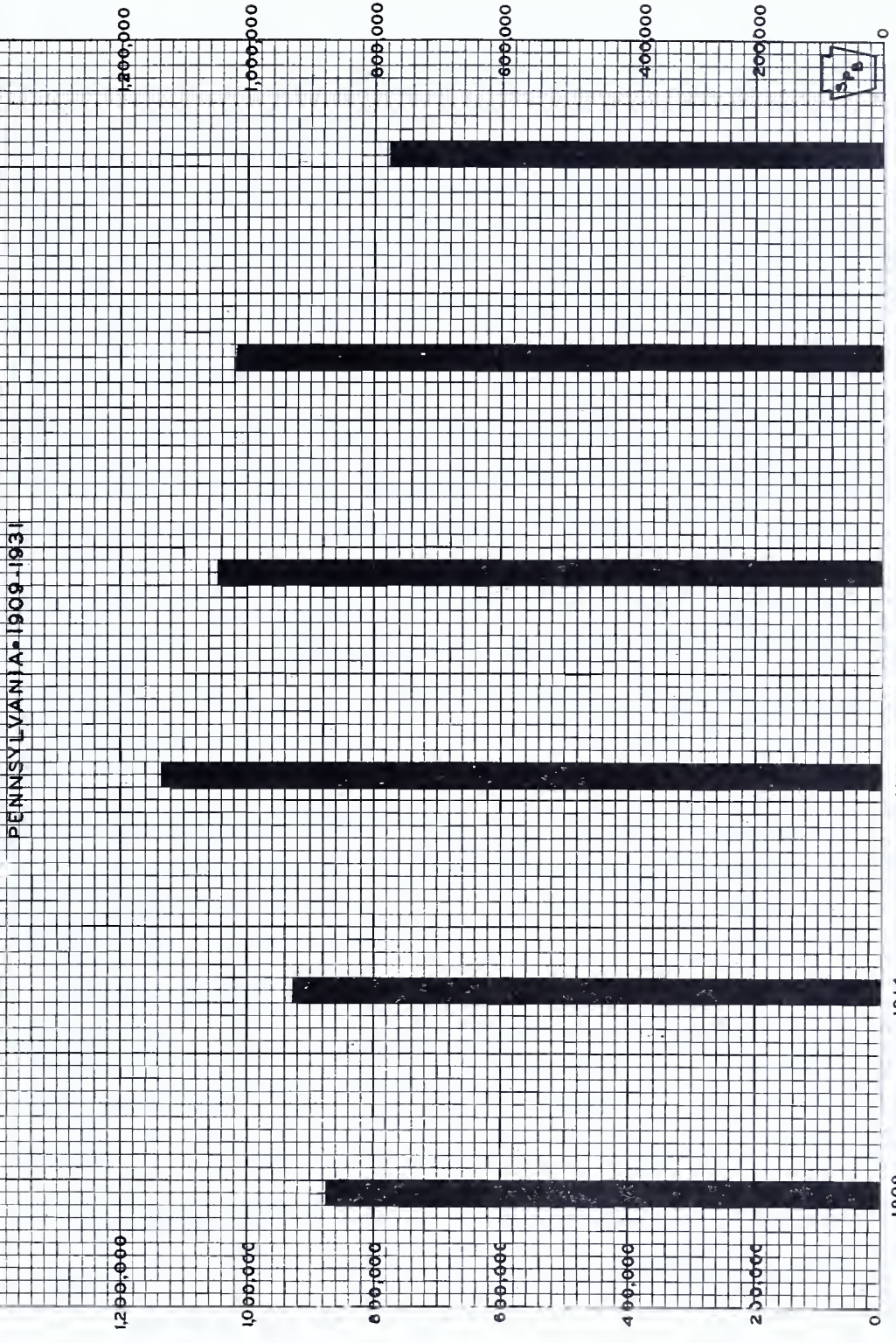
Admittedly the decrease in the number of wage earners required in 1931 as against 1929 was the result of business recession, yet the fluctuations in the number of wage earners have in no other way been spectacular. They have instead shown a tendency, up to 1929, to increase at a very moderate rate.

WAGE EARNERS IN MANUFACTURING

NO. OF WAGE EARNERS

NO. OF WAGE EARNERS

PENNSYLVANIA 1909-1931



ADAPTED FROM CENSUS OF MANUFACTURES

1931
FIGURE NO. 91

The reason for this relatively slight change is that improvements in mechanical processes have increased the productivity of the industry without requiring any great change in the wage earning body.

An indication of the advance in mechanization is given in a comparison of the data on primary horse power in 1909 and in 1929, the last year for which it was reported. In the former year there was a total of 2,903,413 primary horse power available to industry in Pennsylvania, an average of 3.3 horse power per wage earner. During the succeeding twenty years the total of primary horse power increased to 5,991,493, and an average of 5.9 horse power for each wage earner. The mechanical assistance available to each wage earner therefore increased almost 80 per cent during that period. The number of horse power, however, is not to be considered other than as an indication of mechanical advance. The greatest advances have been made in the secondary apparatus, operated either by the prime mover or by purchased electric current.

Advancing mechanization had its desired result: increased productivity. The average real value of products per wage earner, i.e. converted to the common dollars of 1923-25, amounted to \$4,460 in 1909 and increased steadily to \$7,740 in 1929, and fell to \$7,300 in 1931. The gain up to 1929 was equivalent to more than 73 per cent. The real value of products per horse power showed an increase of little more than 5 per cent over this period, and, in fact, suffered a decline from 1923-25 to

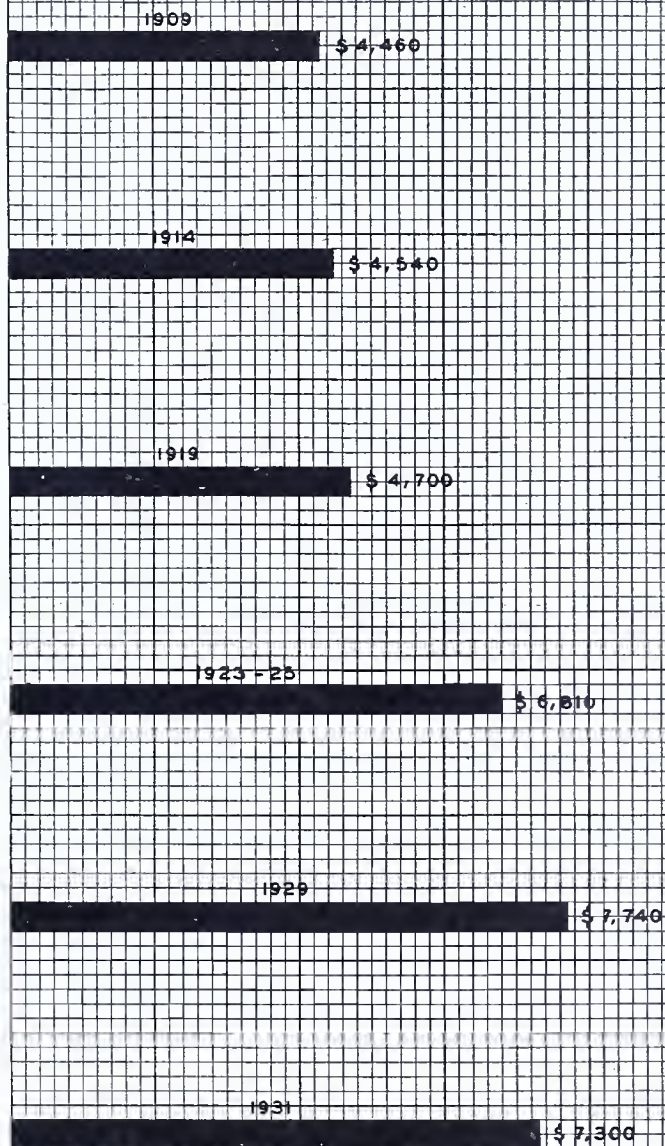
1929 of almost 4 per cent.

A measurement of the degree of technologic advancement, or the movement toward intensified mechanization and its resultant displacement of the wage earner, cannot be made because of the lack of pertinent data on the number of man-hours required to produce the many products of industry at present compared with some period in the past. In the accompanying table, however, some suggestion of this advance is given. The tabulation shows the number of men required to produce a given quantity of goods in 1920, as against the number required for the production of the same quantity in 1929 when production was at peak. The data on relatively few products of manufacture were suitable for this analysis, and the picture is therefore limited.

PRODUCTIVITY IN MANUFACTURING

REAL VALUE OF PRODUCTS PER WAGE
EARNER

PENNSYLVANIA • 1909-1931



DISPLACEMENT OF WAGE EARNERS

Relative number required in 1920 as
compared with 1929*

<u>Industry</u>	<u>Number of wage earners</u>	
	<u>1920</u>	<u>1929</u>
Boots and shoes	100	78
Boxes, cigar	100	98
Brick, building	100	104
Cement	100	56
Cigars	100	65
Coal, anthracite	100	129
Coal, bituminous	100	89
Coke, bee-hive	100	81
Coke, by-product	100	64
Gasoline	100	82
Ice cream	100	81
Iron, pig	100	29
Plates, iron and steel	100	50
Sheets, iron and steel	100	56
Bars, iron and steel	100	107
Sugar, refined	100	53
Vinegar	100	46
Wire rods	100	63

* Adapted from "Productive Industries," State Department of
Internal Affairs.

As the table shows there were eighteen classes, only three of which showed an upward tendency. In each case conditions peculiar to that particular industry were responsible. In the case of building bricks a recession had already been noted in the construction business, so that peak production was not required. The increase in anthracite coal was caused by a reduction in the number of days worked by the miners. In 1931 the figure was 181, compared with 225 days in 1927. The recession during the four year period was constant. The manufacture of bars, iron and steel had reached a point of efficiency in 1925 at which only 60 men were required. Production thereafter fell, reaching a low in 1928. Recovery was almost complete in 1929 when it was interrupted by the general decline of business.

Advancing technology is one of the factors responsible for the movement toward concentration of manufacturing activity in larger establishments. From 1909 to 1931 manufacturing establishments fell in number from 27,563 to 14,774, or less than 54 per cent of the 1909 total. The average establishment in Pennsylvania in 1909 employed 32 wage earners, and had 106 primary horse power; in 1929 it engaged 60 wage earners and had 354 horse power.

LEADING MANUFACTURING INDUSTRIES

An analysis of nineteen of Pennsylvania's leading manufacturing industries, representing almost 60 per cent of the total value of products manufactured in 1929, shows that

twelve of them are in relatively good condition; four are just holding on, and three are distinctly declining.

In the first class are: Bread and other bakery products; car and steam railway repair shops; clay products; electrical machinery, apparatus and supplies; steel works and rolling mills; engraving; ship and boat building; silk and rayon manufacture; and cigars and cigarettes.

In the second class are: Clothing, men's; coke, not including gas-house; foundry and machine shop products; and blast furnaces.

In the third class are: Leather, tanned, curried, and finished; sugar refining; and worsted goods.

The following tabulation shows the number of establishments, number of wage earners, and the value of products in these industries for the year 1929, which year may be considered to represent the peak of production. There is also shown for all three items the slope or trend, in positive or negative percentages according as the item rises or falls. The quantity indicates the movement of the item in five-year intervals over a period of twenty years.

For instance, take the baking industry. It is to be noted that the number of establishments is decreasing at the rate of 3.6 per cent every five years, the number of wage earners is increasing at the rate of 2.8 per cent while the value of products is rising 4.0 per cent. These values are signifi-

cant as indications of what is happening within the industry rather than as absolute measures of growth or decline.

Reference to the table will show that Pennsylvania's establishments are decreasing at the rate of 3.4 per cent every five years while those of the United States are increasing at a rate of approximately one per cent. The number of wage earners in the State is increasing 0.8 per cent every five years, while those of the country at large are gaining 1.5 per cent. Pennsylvania's value of products rises 3.0 per cent while that of the U. S. gains 3.7 per cent. It is scarcely necessary to say that these trends will inevitably reach an unpredictable point at which they will tend to flatten out or become stable, rather than to pursue these courses and ultimately lose all reasonable proportion.

PENNSYLVANIA

<u>INDUSTRY</u>	<u>1929</u>		Trends 1909-1929 Average for five year Intervals			
	Number of Etab.	Number of Wage Earners	Value of Products M.\$	±Est.	±Wage E.	R.V. of P.
Bread & Other Bakery Products	1,929	23,960	170,609	-3.6	+2.8	+4.0
Car & Steam Hwy. Repair Shop	194	53,391	205,363	+1.5	+0.7	+2.6
Clay Products	245	16,933	59,491	-1.7	+1.9	+3.9
Clothing, Men's	384	18,473	98,347	-3.4	-1.6	+2.4
Coke, Not including Gas House	69	5,856	115,345	-1.7	-4.5	+2.4
Electrical Machy, App. & Supplies	137	47,373	347,141	+2.0	+5.2	+7.2
Foundry & Machine Shop Products	879	55,364	374,041	-5.2	-3.2	+1.2
Iron & Steel, Blast Fur.	30	6,186	280,712	-3.5	-2.8	+1.5
Iron & Steel, Steel Works & Rolling Mills	158	145,684	1,212,877	-0.7	+0.8	+2.1
Knit Goods	482	62,141	294,325	+0.4	+2.3	+7.2
Leather, Tanned, Curried & Finished	62	8,876	95,959	-6.3	-2.7	-1.4
Meat Packing	132	5,232	132,783	-1.1	+2.2	+2.5
Petroleum Refining	48	7,895	243,259	+0.7	+3.2	+5.2
Photo. Engraving	44	959	6,077	+1.8	+2.8	+5.4
Ship & Boat Building	17	3,356	13,488	-4.4	+0.1	+1.5
Silk & Rayon Mfr.	497	61,544	320,936	+3.1	+2.2	+4.4
Sugar Refining	3	1,715	73,989	0(1)	-6.3	-1.6
Tobacco, Cigars & Cigaretts	330	25,221	108,061	-19.3	-1.4	+2.0
Worsted Goods	61	10,692	81,205	-2.9	-3.2	-0 (2)
All Others				-----	-----	-----
Total (Penna.)	16,947	1,014,046	7,443,861	-3.4	+0.8	+3.0
U. S.	210,959	8,838,743	70,434,865	+0.9	+1.5	+3.7

(1) Constant (2) Less than 0.1 per cent, but downward trend.

WAGES IN MANUFACTURING

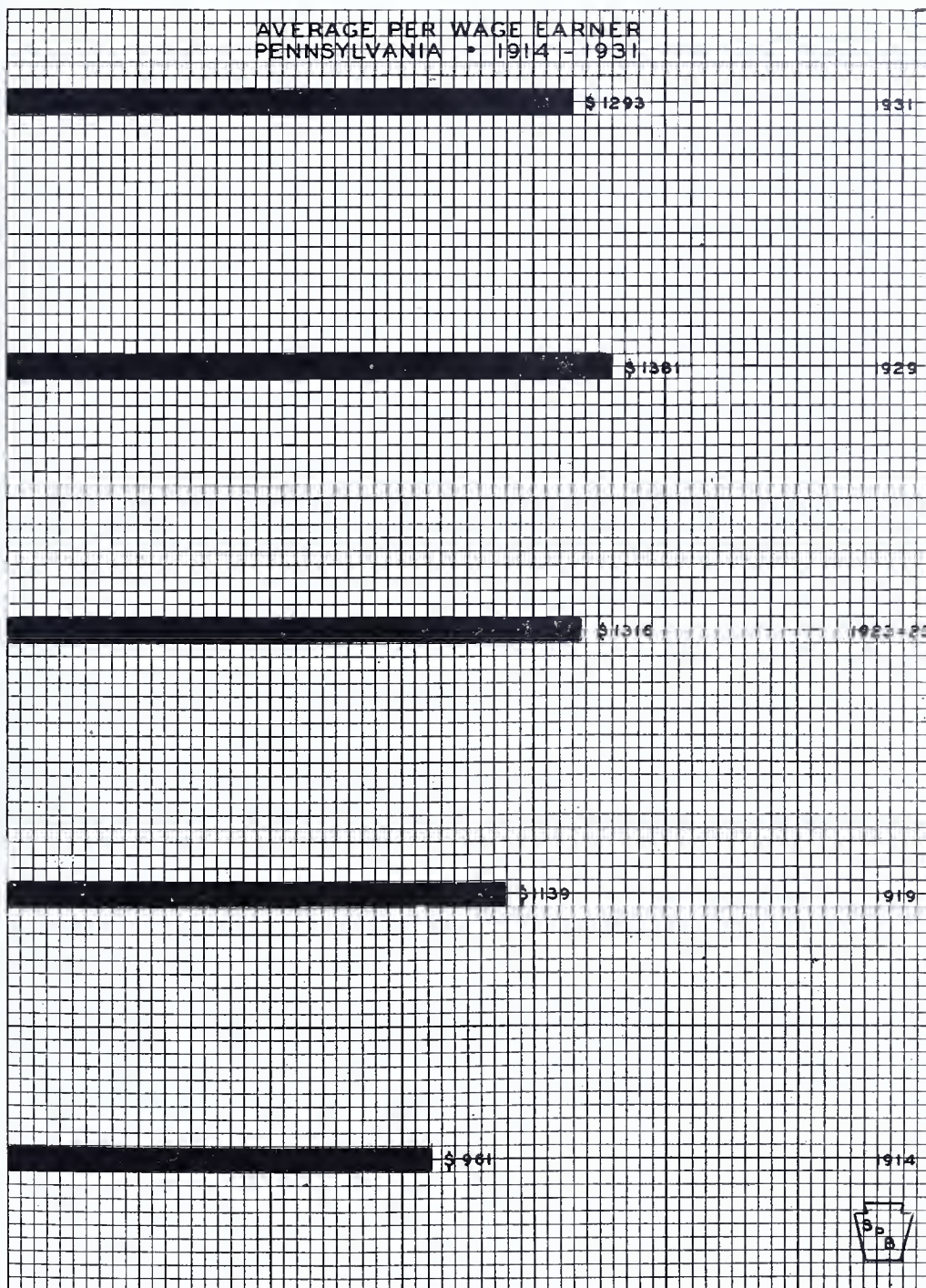
The total of wages paid in manufacturing plants reached its highest volume in 1919 as a result of the war stimulation. Up to that time the total had been relatively low, but during the post-war period the wage level, speaking broadly, was maintained.

The Census of Manufactures shows that the average wage in Pennsylvania in 1909 amounted to \$520 per year. This rose to \$571 in 1914 and to \$1,239 in 1919. The highest average wage was paid in 1929, \$1,360.

These averages, however, are not efficient indicators of wage payments because of the changes in the cost of living. If the average wage is converted into dollars having the same buying power as the dollars of the 1923-25 period, then the average wage of 1914 amounted to \$961; 1919, \$1,139; 1923-25, \$1,316; 1929, \$1,381; and 1931, \$1,293. Real wages, therefore, have shown consistent increases throughout the period, suffering a decline only in the period 1929-31.

The average wage in actual dollars, the average wage in the common dollars of 1923-25, and their indexes of change from 1909 to 1931 are shown in the following table.

REAL WAGES IN MANUFACTURING



ADAPTED FROM CENSUS OF MANUFACTURERS

FIGURE NO. 93

MANUFACTURING WAGES
1909 - 1931

Totals, real and actual average
wages and index of change.

Year	Amount of Wages	Average wage (1)	
		Actual	Real
1909	\$455,627,000	\$520	-- (2)
1914	527,953,000	571	961
1919	1,406,066,000	1,239	1,139
1923-25	1,379,722,000	1,316	1,316
1929	1,379,444,000	1,360	1,381
1931	845,607,000	1,089	1,293

Index of Change - 1923-25=100.

1909	33.1	39.5	-- (2)
1914	38.3	43.4	73.1
1919	102.0	94.2	86.6
1923-25	100.0	100.0	100.0
1929	99.9	103.2	104.9
1931	61.4	82.8	98.4

(1) The average wage is intended to show the growth in the total wage payment, rather than the earnings of an individual.

(2) The real wage for 1909 cannot be computed as the cost of living for that year was not reported.

DIVERSIFICATION OF MANUFACTURING

Approximately 70 per cent of all the classifications of manufacturing industries in the country are represented in Pennsylvania----technically a "diversification ratio" of that amount. Analysis of the number of types of manufacture reported in the Census of Manufactures shows that Pennsylvania had 226 classes of manufacturing industries in 1929 out of 326 for the country. This was a large increase over the figures for 1909, in which year Pennsylvania had only 94 classes, and the country 259.

The degree of diversification in manufacturing industries is an indication of the relative stability of a community with respect to employment, production and general economic well-being. It is obvious that any community dependent on one, or few, industries, is in distress when those industries experience difficulty. In the same manner a community having a larger variety of manufacturing plants will not feel, to as great an extent, the difficulties of one plant or industry while the others follow their normal courses of production.

Compared with the state total, the Industrial Area of Philadelphia has the largest ratio of diversification, 70.8 per cent with 160 classes. The Industrial Area of Pittsburgh ranks second with 36.7 per cent and 83 classes. The Scranton-Wilkes-Barre, Reading, and Allentown-Bethlehem Areas have approximately the same ratios.

Diversification Ratios by Industrial Areas, 1929

Industrial Area	No. of Classes	Percent of State total
Philadelphia	160	70.8
Pittsburgh	83	36.7
Scranton-Wilkes-Barre	36	15.9
Reading	34	15.0
Allentown-Bethlehem	32	14.2

LOCATION OF MANUFACTURING INDUSTRIES

More than 70 per cent of the value of manufactured products is produced in the five industrial areas as set up in the Census of Manufactures of 1929. The Philadelphia Industrial Area,* which includes five counties in the southeastern portion of the state, and three counties in New Jersey (these have been eliminated in this analysis), accounted for 35.1 per cent of the State's total; the Pittsburgh Area, 27.1 per cent; the Allentown-Bethlehem Area, 5.3 per cent; the Reading Area, 3.1 per cent; and the Scranton-Wilkes-Barre Area, 2.5 per cent.

In order to probe the economic soundness of the several counties with respect to their manufacturing activity, an analysis of the trends of number of wage earners and the value of products in relation to the state totals from 1916 to 1929 and from 1929 to 1931, was made. The results show that there were nineteen counties in which the gain had been consistent

* The Philadelphia Area includes Bucks, Chester, Delaware, Montgomery and Philadelphia Counties in Penna.; the Pittsburgh Area includes Allegheny, Beaver, Washington and Westmoreland Counties; the Allentown-Bethlehem Area, Lehigh and Northampton Counties; the Reading Area, Berks County; and the Scranton-Wilkes-Barre Area, Lackawanna and Luzerne Counties.

throughout the whole period; ten counties that experienced nothing but decline; and thirty-eight counties in which the trends were mixed, in most cases the result of latter day influences. These trends are shown in the following table.

Counties Showing Upward Trends in Number of Wage Earners
and in Value of Products - 1916 to 1929 and to 1931

Adams	Clinton	Lancaster
Berks	Crawford	Lebanon
Blair	Cumberland	Montgomery
Bradford	Fulton	Northumberland
Bucks	Huntingdon	Somerset
Centre	Juniata	Susquehanna
		Wyoming

Counties Showing Downward Trends in Number of Wage Earners
and in Value of Products - 1916 to 1929 and to 1931

Allegheny	Indiana	Perry
Columbia	Montour	Potter
Fayette	Northampton	Sullivan
		Venango

Counties Showing Upward Trends in Number of Wage Earners
and in Value of Products - 1916 to 1929 (varying trends
since 1929)

Armstrong	Greene	Mifflin
Beaver	Lackawanna	Monroe
Delaware	Lehigh	Snyder
Erie	Luzerne	Union
Franklin	Lycoming	Warren

Counties Showing Downward Trends in Number of Wage Earners
and in Value of Products - 1916 to 1929 (varying trends
since 1929)

Cambria	Dauphin	Jefferson
Cameron	Elk	McKean
Clearfield	Forest	Mercer
		Tioga
		Westmoreland

Counties Showing Gains in Number of Wage Earners; Losses in Value of Products - 1916 to 1929 (varying trends since 1929)

Bedford
Butler

Carbon
Lawrence

York

Counties Showing Loss in Number of Wage Earners; Gains in Value of Products - 1916 to 1929 (varying trends since 1929)

Chester
Clarion

Philadelphia
Schuylkill

Washington
Wayne

Note: Pike County is not included in this table as its manufacturing industry is extremely small.

Based on the data of the Penna. Dept. of Internal Affairs.

The twenty leading counties, ranked according to their value of products in 1931, are tabulated as follows: *

Rank	County	Value of Products
1.	Philadelphia	\$1,202,426,500
2.	Allegheny	819,542,000
3.	Luzerne	194,578,700
4.	Delaware	172,285,400
5.	Beaver	141,016,500
6.	Berks	135,328,000
7.	Montgomery	126,906,300
8.	Lackawanna	111,492,700
9.	Westmoreland	104,408,300
10.	York	99,704,900
11.	Lehigh	98,682,100
12.	Lancaster	94,882,800
13.	Schuylkill	94,752,000
14.	Northampton	93,687,300
15.	Washington	92,819,200
16.	Dauphin	87,576,100
17.	Erie	87,224,300
18.	Mercer	67,279,500
19.	Cambria	61,562,900
20.	Blair	59,268,100.

* State Department of Internal Affairs.

MIGRATION AND DECENTRALIZATION OF INDUSTRY

A tendency on the part of industry to migrate from industrial centers to small outlying towns or to states where adequate labor, power and distribution facilities are available, and where it may find a more or less temporary escape from urban taxation, has been noted in the past. But in the absence of any specific data, little more can be said that such a movement exists. However, in any industrial planning program the basic reasons for this drift should be studied and calculated.

RETAIL TRADE

Pennsylvania, with 7.9 per cent of the population of the United States, reported 7.7 per cent of the total retail sales in 1929, amounting to \$3,803,941,000, according to the first Census of Distribution made by the Census authorities. The reports show that there were 135,275 stores, employing 317,099 full-time workers, and 56,045 part-time workers.

Since this information was first collected in 1929, the trend of retail sales must be based on the tax information collected by the State's Mercantile Appraisers. As only the sales within the State are taxable, i.e., interstate deliveries are not taxable, these totals amount to approximately 75 per cent of the actual sales total. With this qualification in mind, the following index may be considered to represent the movement of retail sales in Pennsylvania..

INDEX OF MOVEMENT IN RETAIL
SALES, PENNA., 1920 - 1932

(1923-25=100)

1920	79.0
1923-25	100.0
1929	114.3
1931	90.2
1932	76.3

WHOLESALE TRADE

The State is credited with almost 7 per cent of the wholesale trade of the country in 1929. According to the Census of Distribution for that year there were 10,542 establishments, with 113,655 employes, and sales amounting to \$4,777,292,000.

The trend of wholesale sales from 1920 to 1932, based on the tax information of the Mercantile Appraisers, is shown in the following index:

INDEX OF MOVEMENT
1920 - 1932

(1923-25=100)

1920	104.7
1923-25	100.0
1929	100.4
1931	71.5
1932	62.5

The leading counties, with their percentages of the total retail sales of the State in 1929, before the general decline set in, are shown below:

RETAIL SALES, LEADING COUNTIES IN PENNA.
PER CENT OF STATE TOTAL, 1929

County	Percentage
Philadelphia	27.0
Allegheny	18.6
Luzerne	3.2
Montgomery	2.9
Berks	2.7
Westmoreland	2.4
Lackawanna	2.2
Dauphin	2.2
Lancaster	2.1
Washington	2.0
Delaware	1.9
Cambria	1.7
Northampton	1.7
Erie	1.6
Blair	1.6
Schuylkill	1.6
Fayette	1.5
All others (50 Counties)	23.1
Total	100.0

WHOLESALE SALES, LEADING COUNTIES IN PENN.
PER CENT OF STATE TOTAL, 1929

County	Percentage
Philadelphia	43.6
Allegheny	22.8
Berks	2.7
Dauphin	2.5
Luzerne	2.4
Lackawanna	2.3
Lancaster	1.6
Blair	1.5
Cambria	1.3
Erie	1.2
Montgomery	1.0
Schuylkill	0.9
Westmoreland	0.8
Northampton	0.8
Washington	0.8
Fayette	0.7
Delaware	0.6
All others	12.5
Total	100.0

UTILITIES

Railroads employ the greatest number of workers of industries in the utility group, reporting a total of 453,022 employes in 1931. This is five times as many as all other utilities combined. Telephone companies ranked second, and electric companies third. A summary of the number of employes, wages, average wage, and gross receipts for 1931 follows:

UTILITIES IN PENNA. 1931, EMPLOYES, WAGES AND GROSS RECEIPTS

Type of Company	Number of Employes	Wages	Average Wage	Gross Receipts
Telephone	26,640	\$41,586,477	\$1,560	\$371,292,084
Telegraph	3,794	4,204,931	1,110	112,784,805
Steam Railroads	453,022	765,329,615	1,690	1,459,499,145
Street Railways	19,737	34,408,516	1,740	80,768,889
Electric	23,453	41,862,091	1,780	194,305,008
Gas, natural	6,548	9,915,066	1,520	46,491,237
Gas, mfd	6,604	10,376,895	1,570	36,383,455
Water	7,343	9,255,387	1,270	40,610,413

Indexes of change in number of employes, wages and gross receipts for the various industries of the utility group are shown in the following:

Telephone Companies in Pennsylvania

(Index of Change 1923-25=100)

	No. of Employees	Total Wages	Revenue
1921	79.1	74.3	71.4
1923-25	100.0	100.0	100.0
1927	96.1	112.1	155.7
1929	107.9	127.6	165.5
1931	91.6	121.3	170.3

Telegraph Companies in Pennsylvania

(Index of Change 1923-25=100)

	No. of Employees	Total Wages	Revenue
1921	91.4	107.0	87.2
1923-25	100.0	100.0	100.0
1927	74.0	114.0	111.1
1929	104.5	96.2	124.2
1931	84.3	88.9	91.9

Steam Railroads and Street Railways in Pennsylvania

(Index of Change 1923-25=100)

	Railroads			Street Railways		
	No. of Employees	Total Wages	Revenue	No. of Employees	Total Wages	Revenue
1921	90.8	88.3	84.2	102.9	97.6	97.0
1923-25	100.0	100.0	100.0	100.0	100.0	100.0
1927	95.0	91.3	96.3	87.1	95.6	96.3
1929	90.1	88.6	98.1	78.4	85.5	90.1
1931	77.6	76.1	71.1	66.6	68.8	68.9

Gas Companies in Pennsylvania

(Index of Change 1923-25=100)

	Natural			Manufactured		
	No. of Employees	Total Wages	Revenue	No. of Employees	Total Wages	Revenue
1921	93.7	86.9	74.7	112.8	111.2	89.7
1923-25	100.0	100.0	100.0	100.0	100.0	100.0
1927	106.9	115.6	98.6	106.1	116.6	113.1
1929	121.2	118.6	104.2	100.1	111.2	117.1
1931	92.4	94.9	84.1	106.2	117.0	117.9

Electric and Water Companies in Pennsylvania

(Index of Change 1923-25=100)

Electric Companies				Water Companies		
	No. of Employees	Total Wages	Revenue	No. of Employees	Total Wages	Revenue
1921	64.4	66.0	67.6	89.3	88.2	88.6
1923-25	100.0	100.0	100.0	100.0	100.0	100.0
1927	117.0	127.9	130.1	105.2	115.6	112.1
1929	105.3	131.0	147.8	98.8	111.2	121.1
1931	101.6	127.1	145.9	98.1	101.9	123.2

OCCUPATIONAL TRENDS

During the twenty years from 1910 to 1930 a shift in occupation from the productive ¹ to the service industries was noted throughout the country. The shift in Pennsylvania, which reported a total of 3,722,103 gainful workers more than ten years of age in 1930, ² was not so pronounced as that of the United States as a whole.

As will be noted on the accompanying chart, a regular increase has taken place in the number of gainful workers reported in Pennsylvania from 1910 to 1930, while the number of gainful workers in the whole of the United States showed a relatively greater increase from 1920 to 1930 than from 1910 to 1920. The productive group of the United States has shown an increase over the 1910 figure of 6.5 per cent, while Pennsylvania's productive group has increased only 1.6 per cent. The country's service group increased from 1910 to 1930 sixty-five per cent; Pennsylvania's forty-seven per cent.

1. The productive group includes: manufacturing, mining, forestry, fishing, agricultural and mechanical industries; service includes transportation and communication, trade, public service, professional service, domestic and personal service and clerical occupations.

2. Gainful workers 10 to 16 years of age are little more than two per cent of the total gainful workers. The totals of ten years of age and over follow the regular government set-up and are used here without regard to the restrictions placed on the employment of this group.

The shift in the State may be attributed largely to the changing status of the State's productive industries. Wage earners required in manufacturing are approaching the point where no further increases in number will be necessary. The mining industry requires fewer workers because of a number of difficulties which the industry is now experiencing. In the absence of increasing opportunity of employment in these industries, the gainful worker must turn to the service enterprises.

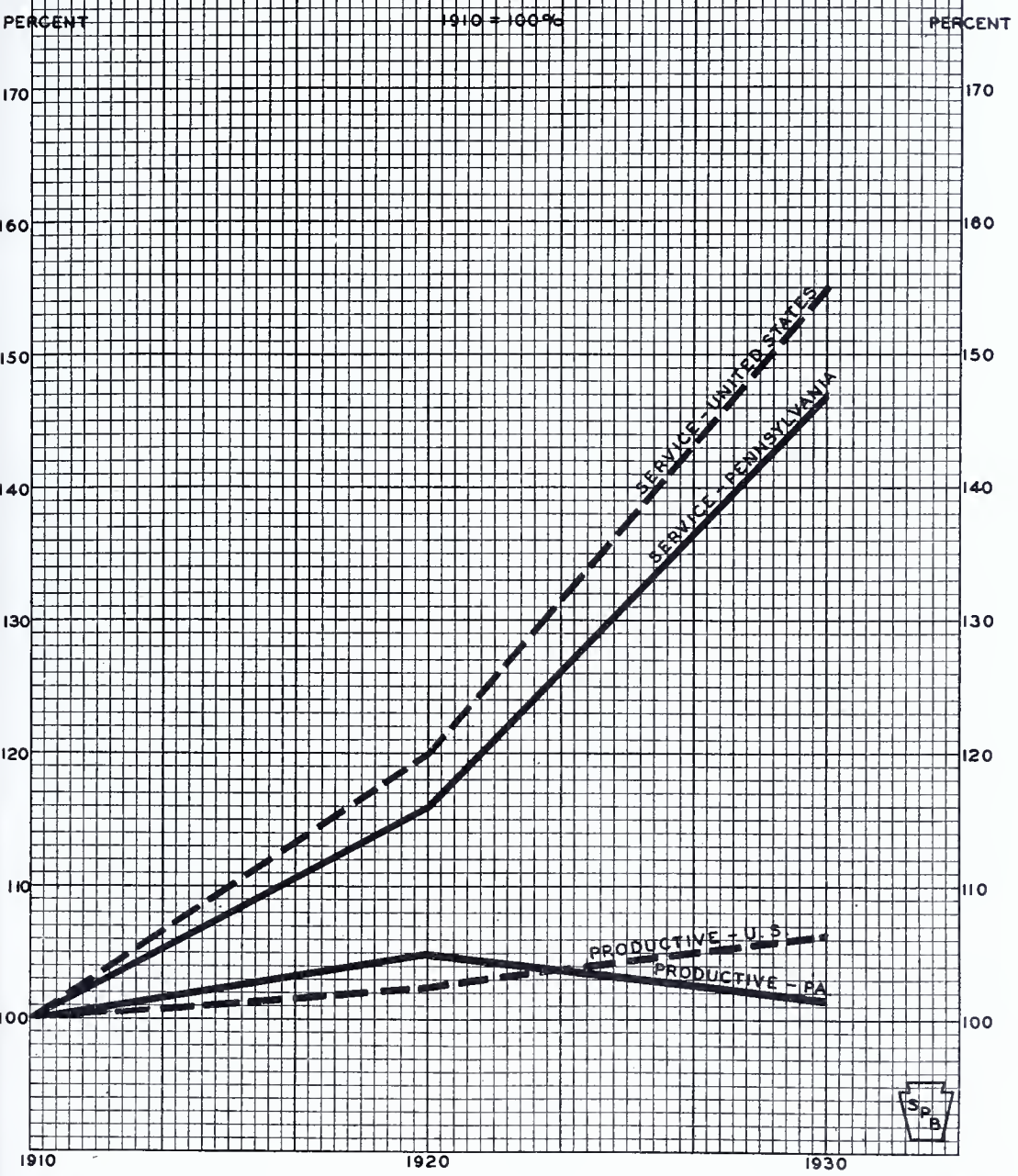
The number of gainful workers in Pennsylvania has been decreasing in relation to the total number in the United States and to the population of the Commonwealth. In 1910, the State reported 8.2 per cent of the country's gainful workers, and in 1930, 7.6 per cent. In 1910 gainful workers in Pennsylvania were equivalent to almost 41 per cent of the state's population; in 1930 the ratio had fallen to 38.7 per cent.

In the following tables it will be noted that the percentages shown for the productive group (the first three items) have tendencies to remain static or to decrease slightly. All the other classes, which constitute the servicegroup, have increased in relation to the total.

TREND OF GAINFUL WORKERS

CHANGE IN WORKERS IN PRODUCTIVE & SERVICE GROUPS
1910 - 1930

1910 = 100%



GAINFUL WORKERS OVER TEN YEARS OF AGE IN
PENNSYLVANIA

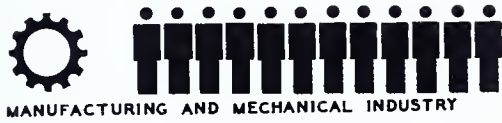
(Per cent distribution by classes)

	1930	1920	1910
Agriculture, Forestry & Fishing	6.8	8.3	11.6
Extraction of Minerals	8.1	9.7	10.5
Mfg. & Mechanical Ind.	38.1	41.6	40.0
Trans. & Communications	8.6	8.3	7.6
Trade	12.3	9.9	9.8
Public Service	1.8	1.6	1.1
Professional Service	6.4	4.8	4.2
Domestic & Personal Service	9.0	7.5	9.8
Clerical	8.9	8.3	5.4
Total	100.0	100.0	100.0

GAINFUL WORKERS OVER TEN YEARS OF AGE IN UNITED STATES

(Per cent Distribution by Classes)

	1930	1920	1910
Agriculture	21.9	26.3	33.2
Extraction of Minerals	2.0	2.6	2.5
Mfg. & Mechanical Ind.	28.9	30.9	27.9
Transportation & Communication	7.9	7.4	6.9
Trade	12.5	10.2	9.5
Public Service	1.8	1.8	1.2
Professional Service	6.7	5.2	4.4
Domestic & Personal Service	10.1	8.1	9.9
Clerical	8.2	7.5	4.5
Total	100.0	100.0	100.0



GAINFUL WORKERS BY OCCUPATIONAL GROUPS EACH FIGURE = 100,000 PERSONS

FIGURE NO. 95



RETAIL DISTRIBUTION*

Retail distribution is the process of selling goods for use or consumption, together with services incidental to their sale. The position of the retailer in society is to supply the wants of the people and to make available at the right time and at a convenient place a reasonable selection of goods to supply those wants. The retail business is carried on directly with the people without intermediaries and is the one business whose contacts reach them in all the walks of life. The retailer obviously is the point of contact between the manufacturer and the public, for through him the manufacturer determines what goods to produce in order to meet actual and potential requirements, what alterations to make in existing products, what new styles to provide for, what products to abandon, and what manufacturing schedules to set up.

Pennsylvania in 1929 carried on in its 135,275 stores, a retail business of \$3,803,941,000, representing a per capita expenditure of \$395.00. The transaction of this business engaged the attention of 506,075 persons or 5.25 per cent of the State's entire population and 13.59 per cent of the 3,722,103 people ten years or over in the State who were gainfully employed.

Preliminary figures of the 1933 Census of Distribution

* The data examined was to a large extent that found in the 1929 Census of Retail Distribution which is the last and only complete census now available in detail, and statistics obtained by the United States Department of Commerce.

PENNSYLVANIA SUMMARY - RETAIL DISTRIBUTION

	1929	1933	Per Cent Changes
Number of Stores	135,275	115,421 ^x	-15
Sales	\$3,803,941,000	\$2,014,402,000	-47
Employment (Average number throughout year)			
Full time employees	317,099	218,999	-31
Part time employees	49,309	59,029	+20
Proprietors (active)	132,931	118,149	-11
Payroll - Total (Not including compensation of Proprietors)	411,938,500	228,743,800	-44
Full time (Amount)	398,442,100	209,507,000	-47
Part time (Amount)	13,496,400	19,236,800	+43
Average annual earnings per full time employee	1,257	957	-24

^xOwing to field conditions over which the Bureau had no control, there is reason to believe that reports from some of the smaller retail stores in Pennsylvania were not collected. It would appear the number of stores should be about 132,400 and net sales about \$2,070,000,000. These are preliminary figures subject to revision.

PENNSYLVANIA - RETAIL DISTRIBUTION, BY SIZE OF BUSINESS

SIZE OF ANNUAL BUSINESS	NUMBER OF STORES	PER CENT OF TOTAL NUMBER OF STORES	AMOUNT OF NET SALES (1929) THOUSANDS OF DOLLARS	PER CENT OF TOTAL SALES
TOTAL	135,275	100.00	\$3,803,941	100.00
Less than \$5,000	46,089	34.07	99,723	2.62
5000 - 9,999	23,596	17.44	167,194	4.40
10,000 - 19,999	25,358	18.75	355,919	9.36
20,000 - 29,999	12,409	9.17	300,558	7.90
30,000 - 49,999	12,876	9.52	493,596	12.98
50,000 - 99,999	9,268	6.85	628,622	16.52
100,000 - 199,999	3,594	2.66	491,141	12.91
200,000 - 299,999	991	.73	238,585	6.27
300,000 - 499,999	644	.43	241,675	6.35
500,000 - 999,999	311	.23	210,352	5.53
1,000,000 & larger	139	.10	576,575	15.16
Less than \$30,000	107,452	79.43	923,394	24.28
30,000 and larger	27,823	20.57	2,880,546	75.72
30,000 - 199,999	25,738	19.03	1,613,359	42.41
200,000 & larger	2,085	1.54	1,267,187	33.31

indicate the extent of the changes wrought by the depression. Since 1929 there was a net decrease of 24 per cent of all those on the payroll; full time employees decreased 31 per cent, part timers increased 20 per cent. Stores decreased 15 per cent, sales 47 per cent and payrolls 44 per cent. From the fact that there is reason to believe that the number of stores should be about 132,400 in 1933 (see accompanying table), the actual number of stores had a decrease of only 2875, or 2 per cent from 1929.

Sizes of Stores

The \$3,803,941,000 business handled by Pennsylvania's 135,275 stores represents an average of about \$28,000 per store. A large portion of the stores, however, averaged far less than this amount. 107,452 stores or 79 per cent of the total did an annual business of \$923,394,000 or 24 per cent of the aggregate sales. This volume represents an annual average of about \$8,600 per store. The group comprising the remaining 27,823 stores, 21 per cent of the total number, did a business of \$2,880,546,000 or 76 per cent of the total sales. This group represents an average of about \$103,500 annually.

46,089 stores or 34 per cent of the total number, did an annual business of \$99,723,000, or less than 3 per cent of the total sales and an annual average of only \$2,170 per store. As an extreme comparison it is interesting to note that 2,085 stores or one and a half per cent of the total



TWENTY PER CENT OF STORES DO
SEVENTY-SIX PER CENT OF BUSINESS

EACH STORE 20% OF STORES
EACH FIGURE 4% OF SALES



PLANNING
BOARD

FIGURE NO. 96

number had \$1,267,187,000 or one-third of the total sales.

These are all large stores with an annual business greater than \$200,000. It is evident in this field as in many others, a relatively small number of stores account for a large proportion of the business.

Kinds of Business

In general, the retail business is carried on in stores handling more or less distinct lines of goods, dictated and controlled by the buying habits and preferences served in any particular community, but most commodities may be purchased in a number of types of stores. These vary, naturally, in different communities, so that no rigid classification can be made as to specific commodities sold in any one kind of store. Controlling factors include price, credit, delivery, quality, location of store, business hours, and the demand that comes to certain stores which are exclusive distributors of lines aggressively advertised nationally. Obviously some overlapping occurs in the classification of stores. Country stores in some places may sell more food than strictly grocery stores. Department stores are increasing their sales of furniture in some cities. Appliances, music, drugs, tires and so forth, are in some cities sold by department stores and stores of other types in greater volume than in specialized stores. In the Census, all stores are classified according to the principal commodities they sell or according to their popular designation.

For our analysis, we are using groups of related activities

to avoid clouding the picture with too much detail. These groups do the bulk of the business in their commodities and are representative. Fundamentally they are made up as follows:-

Food Group

- Candy and confectionery stores
- Dairy products, eggs and poultry stores
- Fruit and vegetable stores
- Grocery stores
- Meat markets
- Bakery goods stores
- Other stores specializing in food products

General Stores

Country general stores, generally located in places of less than 10,000 population.

General Merchandise

- Department Stores
- Dry goods stores, piece goods stores
- General merchandise stores
- Variety, 5 and 10 to a dollar stores
- Mail order houses, general merchandise by mail

Automotive Group

- Motor vehicle dealers
- Automobile dealers, including farm implements and machinery
- Accessories, tires and batteries
- Filling stations
- Motorcycles, bicycles and supplies
- Garages and repair shops
- Other automotive establishments

Apparel Group

- Men's and boys' clothing and furnishings
- Family clothing stores, men's, women's and children's
- Women's ready to wear specialty stores
- Other apparel stores

Furniture and Household Stores

- Furniture stores
- Floor coverings, draperies, curtains and upholstery stores
- Household appliance stores
- Other home furnishings and appliance stores
- Radio and music stores

Restaurants, Cafeterias and Eating Places

Restaurants, cafeterias and lunch rooms

Lunch counters, refreshment stands, etc.

(Meals served in hotel dining rooms not included.)

Lumber and Building Group

Lumber and building material dealers

Electrical shops (without radio)

Heating and plumbing shops

Paint and glass stores

Other Retail Stores

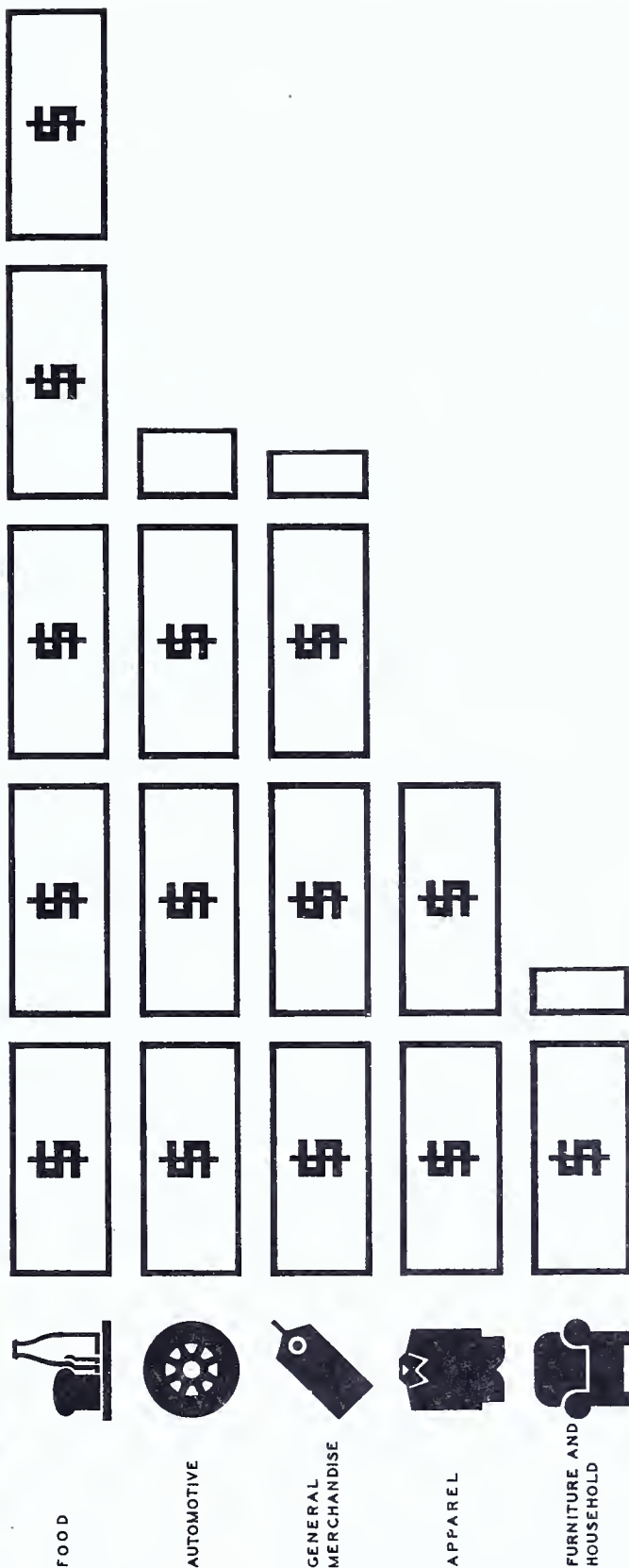
Second-Hand Stores

Pertinent facts of the retail business of the State, segregated to these groups is brought out in the accompanying table. One is immediately impressed with the amount of money the people have spent in the past for food, automobiles and accessories, general merchandise, apparel and household equipment. This expenditure amounts to 73 per cent of the total or an average of \$289.00 for every man, woman and child in the State. 25 per cent of the merchandising dollar was spent in the food group alone. Counting also restaurants, cafeterias and other eating places, the total for food amounts to 28 per cent or an average per capita of \$112.00. Since sales according to the 1933 census dropped 47 per cent, partially accounted for by the drop in the price level, it is reasonable to assume that semi-luxury purchases have been very greatly decreased, due to lack of income and that the percentage of the dollar spent for food is much greater.

It will be of interest to analyze these percentages whenever the detailed figures of the 1933 census become available

PENNSYLVANIA - RETAIL DISTRIBUTION BY KINDS OF BUSINESS

KIND OF BUSINESS	NUMBER OF STORES	PROPRIETORS AND FIRM MEMBERS (NOT ON PAY ROLL)	NUMBER OF EMPLOYEES	NET SALES(1929)	
				AMOUNT (THOUSANDS OF DOLLARS)	PER CENT OF TOTAL SALES
ALL GROUPS	135,275	132,931	317,099	\$3,803,941	100.00
Food Group	52,879	49,563	52,616	942,703	24.78
General Stores	6,200	6,737	7,216	150,755	3.96
General Merchandise group	4,153	3,801	71,384	609,047	16.01
Automotive Group	16,469	16,177	42,477	629,958	16.56
Apparel Group	11,131	10,393	29,245	365,771	9.62
Furniture and Household Group	5,105	4,872	21,572	231,232	6.08
Restaurants, Cafeterias and Eating Places	9,447	10,374	29,166	134,357	3.53
Lumber and Building Group	4,182	4,444	17,323	171,036	4.50
Other Retail Stores	24,624	25,429	45,187	560,076	14.72
Second Hand Stores	1,085	1,141	913	9,005	.24



EACH BILL = 5%

DISTRIBUTION OF RETAIL SALES IN MAJOR GROUPS

1929



PLANNING
BOARD

FIGURE NO. 97



to show just how they have been changed through the effects of the depression.

Types of Operation.

Types of operation of retail stores play an important part in the general scheme of distribution. Over a period of many years several well defined types of operation have developed, the principal ones of which are:-

- Single Store Independents
- Two and Three Store Independents
- Local Branch Systems (operated from a dominant parent store)
- Local Chains (four or more stores centrally merchandised)
- Sectional Chains (store in more than one city, but in more than one section of the country)
- National Chains (with stores in more than one section of the country)

The basic distinguishing difference between chain stores and independent stores is that in a chain store system, all the stores are merchandised from one central merchandising headquarters and supplied from one or more distributing warehouses, or directly from the manufacturer on orders placed by the central buyers. With this in mind, it is possible to differentiate readily between the various systems mentioned. Other types of operation consist of a miscellaneous group made up of mail order houses' catalog selling, roadside markets, utility operated stores handling gas and electric appliances, manufacturer-controlled chains not classified by territory as in the case of sectional and national chains, house-to-house selling, cooperative stores and buying associations and others. The most important of this group are the manufacturer-controlled chains

and the mail order houses' catalog selling. However, the chains of retail stores operated by mail order houses are properly classified as national chains.

The accompanying table shows the segregation of sales to the various types of operation just cited. Contrary to general belief, independent stores still do the major portion of the retail business of the country. Stores numbering 119,808 including single store independents, two and three store independents and local branch systems, constitute 89 per cent of the total number of stores, did \$2,788,201,000 or 73 per cent of the business of all the stores. Sectional and National chain stores to the number of 8,379 or 6 per cent of the total number of stores did \$570,694,000 or 15 per cent of the business.

The growth of the chain store system, which has been particularly noteworthy since 1922, is the most important development in recent years. In the popularly known 5 and 10 cent field, we have an available index which shows the extent of this growth. This index is based on the reported monthly sales of the representative companies.

5 & 10 Cent Chain Store Sales - Annual Index
Monthly Average 1923 - 1925 - 100

Year	Index	Year	Index
1922	74	1928	150
1923	88	1929	164
1924	99	1930	160
1925	113	1931	157
1926	125	1932	135
1927	138	1933	134

Although these figures are based on the sales throughout

PENNSYLVANIA RETAIL DISTRIBUTION-BY TYPES OF OPERATION

TYPE OF OPERATION	NUMBER OF STORES	PROPRIETORS AND FIRM MEM- BERS (NOT ON PAY ROLL)	NUMBER OF EMPLOYEES FULL TIME PART TIME	NET SALES(1929)	
				AMOUNT (THOUSANDS OF DOLLARS)	PER CENT OF TOTAL SALES
TOTAL	135,275	132,931	317,099 56,045	\$3,803,941	100.00
Single store inde- pendents	114,551	125,437	194,573 36,895	\$2,426,648	63.79
Two store independ- ents	4,102	2,955	29,112 2,651	288,398	7.58
Three store inde- pendents	1,145	514	6,559 829	71,979	1.89
Local Branch Sys- tems	10	4	97 ---	1,176	.03
Local Chains	2,895	267	17,666 2,304	197,653	5.20
Sectional Chains	3,727	---	20,121 3,899	227,735	5.99
National Chains	4,652	---	28,420 7,788	342,959	9.02
Other Types of Op- eration	4,193	3,704	20,551 1,679	247,392	6.50

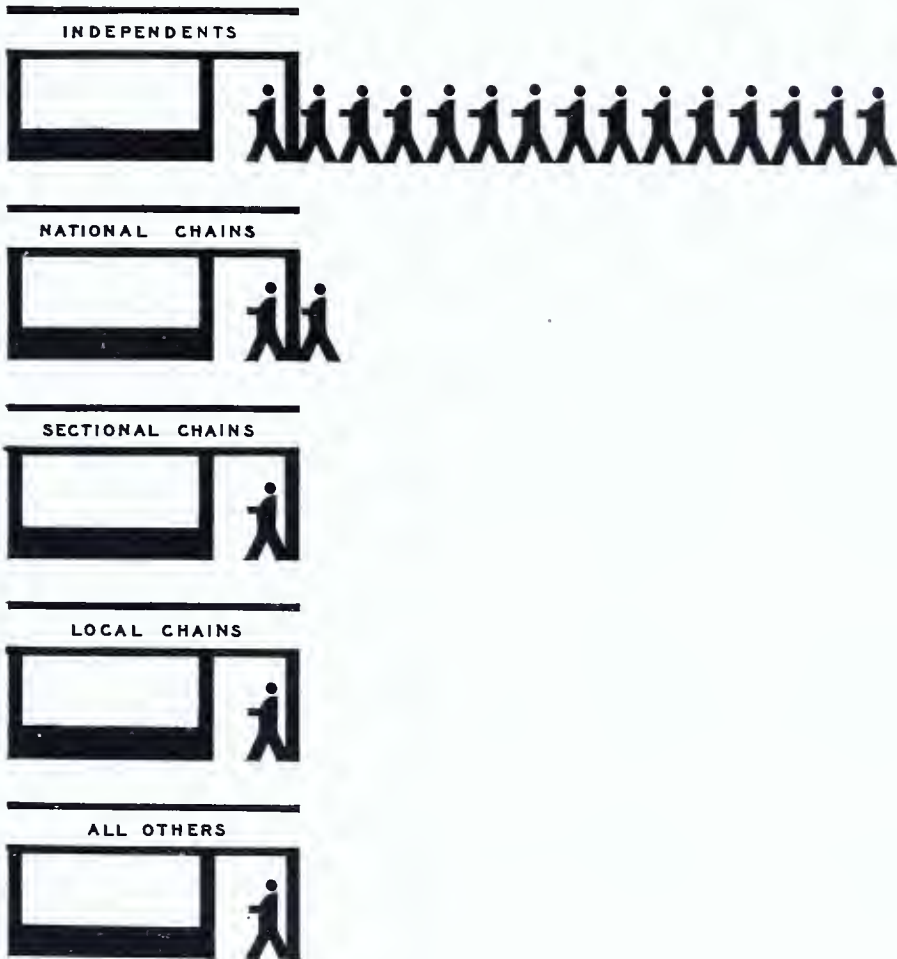
the country, we believe them indicative of most sections and localities. In the grocery trade, the Great Atlantic and Pacific Tea Co. is probably the most representative. In 1922 their annual sales were \$202,434,000 and increased to \$352,093,000 in 1925. In 1930, sales reached a total of \$1,081,092,000, since which time they have decreased somewhat in line with depression trends.

The growth of the chain store system in the grocery and combination grocery and meat store business has been very rapid since 1921 and an analysis of it is of interest, owing to its particular closeness to the people.

In the grocery field alone, 3,769 stores out of a total of 20,950, or 18 per cent, are in sectional and national chain systems and do 51 per cent of the business. This compares with 43 per cent done by single store independents and the remainder by miscellaneous types such as local chains. In the combination grocery and meat business, 1,214 stores out of a total of 9,738 stores or 12 per cent, do 34 per cent of the business, compared to 52 per cent for single store independents.

In the grocery field, these chain stores averaged \$42,100 annually per store while the independents averaged \$8,300 annually per store, a ratio of about five to one.

In the combination grocery and meat store field, the sectional and national chain stores averaged \$88,900 annually per store, while the independents averaged \$21,400 annually per store, a ratio of a little over four to one. Accompanying table gives further details of operation of these two classes of business.



TOTAL RETAIL SALES

EACH FIGURE=5%

FIGURE NO. 98



PENNSYLVANIA RETAIL DISTRIBUTION BY KINDS OF BUSINESS

	TOTAL	SINGLE STORE INDEPENDENTS.	2 & 3 STORE INDEPENDENTS, LOCAL BRANCH SYSTEMS AND LOCAL CHAINS	SECTIONAL AND NATIONAL CHAINS	OTHER TYPES
Grocery Stores (without meats)					
Number of Stores	20,950	16,194	614	3,769	373
Annual net sales (1929)	\$314,441	\$134,498	\$15,809	\$158,860	\$5,275
(thousands of dollars)					
Per cent of total sales	100.00	42.77	5.03	50.52	1.68
Combination Stores (groceries and meats)					
Number of Stores	9,738	7,725	654	1,214	145
Annual net sales (1929)	317,320	165,482	39,162	107,913	4,762
(thousands of dollars)					
Per cent of total sales	100.00	52.15	12.34	34.01	1.50
Total Grocer and Com- bination Stores					
Number of Stores	30,688	23,919	1,268	4,983	518
Annual net sales (1929)	631,761	299,980	54,971	266,773	10,037
(thousands of dollars)					
Per cent of Total sales	100.00	47.48	8.70	42.23	1.59

Credit Business

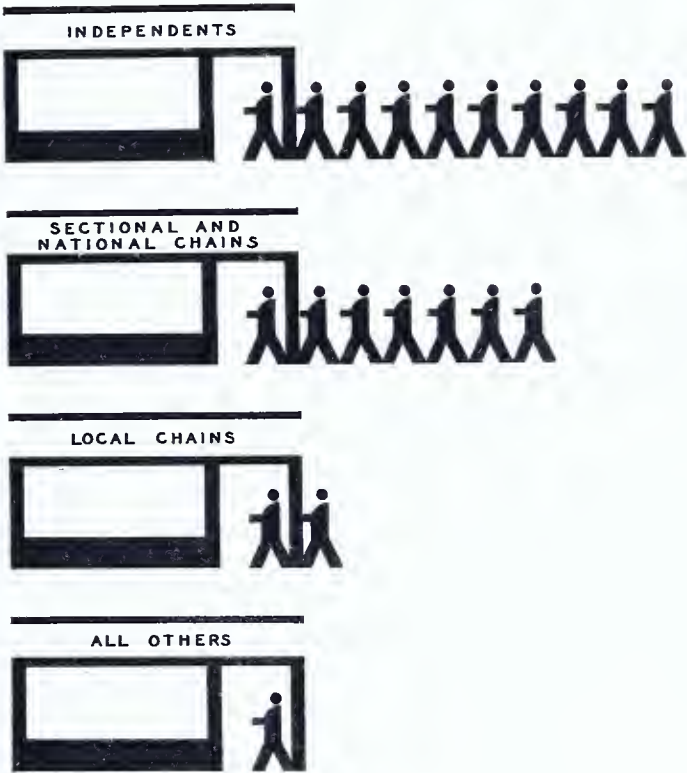
How much of this great volume of merchandising business is carried on for cash and how much on credit? Reports from 115,555 stores, or 35 per cent of the total, doing 89 per cent of the total business show that 61 per cent of their business was on a credit basis. On the basis of reports by types of business, 49,990 stores doing \$2,078,747,000 worth of business or 55 per cent of the total amount of retail sales show that 53 per cent of their sales was on a credit basis. This compares with 53 per cent for independents, 67 per cent for local chains, 71 per cent for sectional chains and 53 per cent for national chains, whose business makes up 91 per cent of the above total.

Reports of credit business from a number of the larger cities are available. These reports are from the following cities, in which 46 per cent of the total retail business of the state is carried on.

Credit Business in Selected Cities

City	No. of Stores reporting Credit Sales	Sales-Thousands of Dollars	Credit Sales in % of Total Sales
Philadelphia	30,667	1,009,246	58.81
Pittsburgh	5,197	335,491	66.03
Scranton	2,024	70,809	64.24
Erie	1,278	51,662	63.90
Reading	1,686	68,732	60.89

A further examination of credit sales in various kinds of



SALES OF MEATS AND GROCERIES

EACH FIGURE = 5%
FIGURE NO. 99



PENNSYLVANIA - CREDIT RETAIL DISTRIBUTION BY TYPES OF OPERATION

TYPE OF OPERATION	NUMBER OF STORES REPORTING CREDIT SALES	NET SALES (1929)		RATIO OF CREDIT SALES TO TOTAL SALES IN STORES REPORTING CREDIT SALES
		TOTAL NET SALES OF SUCH STORES	• NET CREDIT SALES OF SUCH STORES	
TOTAL	49,990	\$2,078,747,254	\$1,106,661,184	53.23
Independent Stores*	46,405	1,662,005,349	880,951,330	53.01
Local chains	730	89,877,794	60,143,654	66.92
Sectional chains	227	68,342,032	48,532,201	71.01
National chains	248	77,668,635	41,424,215	53.53
Other types of operation	2,380	180,853,444	75,609,784	41.8

* Includes single store, 2, and 3 store independents.

business for cities for which detailed data is available is interesting. The accompanying table shows figures for those stores in the major groups which reported credit sales. The wide differences between the percentages in the food and general merchandise groups for the various cities is particularly noticeable. The figures for the automotive and apparel groups are consistent in showing the same credit situation existing in the cities mentioned.

When details of the 1933 census of retail distribution are available, it will be interesting to make a further examination to find out how the years of depression have influenced these ratios.

Credit Business by Kinds of Business in Selected Cities
Per cent of Credit Sales to Total Sales
in Stores Reporting Credit Sales

City	Food Group	Automotive Group	General Merchandise Group	Apparel Group
Philadelphia	52.95	49.50	45.05	51.19
Pittsburgh	42.74	49.78	69.52	55.49
Scranton	58.21	58.55	38.85	53.24
Erie	22.26	54.03	31.19	49.48
Reading	46.67	52.86	53.59	44.39

Retail Shopping Areas

In the foregoing, we have dealt principally with figures on the business of the State as a whole. As a matter of fact, the retail merchandising business has a tendency to flow to well defined centers primarily for reasons of accessibility.

The J. Walter Thompson Co. of New York conducted a large amount of research to determine the shopping areas around central cities including those of Pennsylvania and these areas have been accepted and used by the U. S. Department of Commerce and incorporated in its market Data Hand Book Series No. 30.

The shopping center having been determined by research, the surrounding territory was assigned to it (in Pennsylvania these territories consist of entire counties or multiples thereof) such territory being more accessible to this particular shopping center than to any other. In Pennsylvania there are 32 named areas. In addition, Tioga and Bradford Counties have no specific shopping center assigned while Susquehanna County comes under the Binghamton, N. Y. shopping center. However, the business in all Pennsylvania's 67 counties is included in our figures. The Philadelphia and Allentown - Easton - Bethlehem areas include portions of New Jersey but only Pennsylvania business is considered.

The accompanying map has been prepared to show the location and extent of these areas as well as the name of the shopping center city after which they are called. In population these areas run all the way from 89 per cent urban population for the Philadelphia area to 15 per cent urban for the Gettysburg area and include manufacturing, mining, agriculture and other definite centers of business activity.

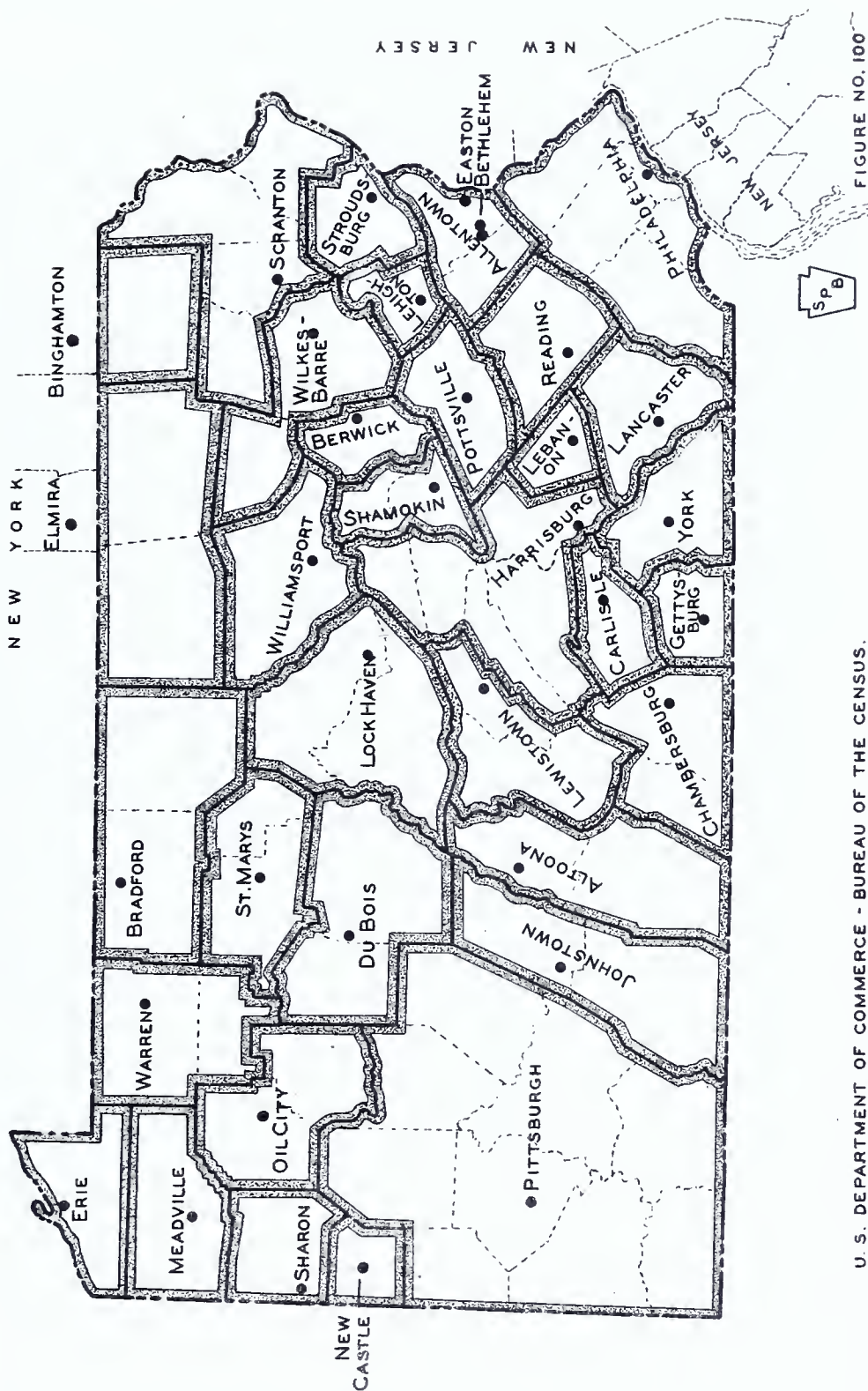
Since these shopping areas are made up of whole counties in every case, it is possible from information at hand to ana-

lyze conditions in most of them. In this analysis we wish to state again that the figures used apply only to business actually conducted within the borders of the State. The Philadelphia and Pittsburgh areas comprise 54 per cent of the people. 70,183, or 52 per cent of the total number of stores, are located in these two areas and they do \$2,288,796,000 or 60 per cent of the total business. The distribution of the balance of the stores and business is shown for all shopping areas and unassigned counties in the accompanying table. In examining the sales figures for the areas, an abrupt drop in business is noticeable beginning in the Shamokin area. Considering all the areas from Philadelphia to Altoona, both inclusive as major areas, it is found that this group, consisting of thirteen areas, has 84 per cent of the population, 84 per cent of the stores, and does 87 per cent of the business. The accompanying table also shows how expenditures reflect the wealth of the various areas, but the fact also must be borne in mind that a certain flow of business is from the smaller areas to the large shopping centers.

Analysis of Selected Areas

Although the area in each case derives its name from the city which is the shopping center, stores in the many towns in each area obviously do a considerable amount of local business. It is of importance to know to what degree and in what particular group the business either flows to the central city or stays at home. It is possible in a number of the shopping areas, enough we believe to be representative, to break down the fig-

RETAIL SHOPPING AREAS



RETAIL SHOPPING AREAS, STORES AND SALES - PER CAPITA EXPENDITURES

RETAIL SHOPPING AREA	NUMBER OF STORES		TOTAL AMOUNT THOUSANDS OF DOLLARS	NET SALES (1929)	
	NUMBER	% OF TOTAL		% OF TOTAL SALES	PER CAPITA SALES
TOTAL FOR STATE	135,275	100.00	\$3,803,941	100.00	395
Philadelphia(Penna.only)	42,353	31.31	1,328,822	34.93	488
Pittsburgh	27,825	20.57	595,974	25.24	384
Wilkes-Barre	7,186	5.31	145,779	3.83	323
Allentown, Easton, Bethlehem, Penna. only	4,935	3.65	144,863	3.81	423
Scranton	5,556	4.11	124,985	3.29	345
Reading	3,087	2.28	100,327	2.64	433
Harrisburg	4,101	3.03	92,566	2.43	390
Johnstown	3,158	2.33	83,684	2.20	295
Lancaster	2,814	2.08	77,220	2.03	392
Erie	2,682	1.99	75,093	1.97	428
Pottsville	5,405	4.00	65,709	1.73	279
York	2,607	1.93	65,254	1.72	390
Altoona	2,378	1.76	60,026	1.58	339
Shamokin	1,840	1.33	38,219	1.00	267
New Castle	1,363	1.01	36,380	.96	374
Williamsport	1,378	1.02	35,580	.94	379
Dubois	1,573	1.16	34,139	.90	246
Sharon	1,274	.94	33,602	.88	339
Oil City	1,289	.95	33,512	.88	343
Bradford	953	.70	28,961	.76	399
Tioga and Bradford Co.	1,259	.93	25,429	.67	314
Meadville	1,001	.74	23,452	.62	372
Lebanon	878	.65	22,035	.58	329
Lock Haven	1,135	.84	21,775	.57	277
Lewistown	1,108	.82	21,756	.57	274
Chambersburg	991	.73	21,568	.57	291
Carlisle	1,014	.75	20,915	.55	307
Warren	557	.41	17,561	.46	377
Lehighton	919	.68	14,641	.38	231
Berwick	584	.43	13,279	.35	272
Stroudsburg	421	.31	10,335	.27	365
Gettysburg	717	.53	9,934	.26	268
St. Mary's	363	.27	8,359	.22	216
Susquehanna County (served by Binghampton, N.Y.)	566	.42	3,157	.21	241

ure we have and develop this point. The areas chosen are:

Philadelphia area	Erie area
Pittsburgh area	York area
Allentown-Easton-Bethlehem area	New Castle area
Reading area	Williamsport area
Lancaster area	Gettysburg area

These form, we believe, a representative cross section of the retail merchandise business of the State. Referring again to the table and considering only the major kinds of business classification, we find that 25 per cent of the merchandising dollar of the State is spent for food, 17 per cent for the automotive group, 16 per cent for general merchandise and 10 per cent for apparel. With these figures in mind, let us examine the conditions in the Pittsburgh area whose population is 65 per cent urban and 35 per cent rural.*

This area is the largest physically and contains the cities of Pittsburgh and McKeesport, thirty-one towns over 10,000 population and 110 towns above 1,000 population and under 10,000. It is possible from the data at hand to isolate the sales made in Pittsburgh and McKeesport and so get the sales made in the balance of the area. It is possible also to segregate these sales in this case to three of the major kinds of business classifications cited above, food, automotive and general merchandise. One is immediately impressed with the change in the percentage of the general merchandise group, in the area excluding Pittsburgh and McKeesport as well as in these two cities themselves.

* Considering towns of 2500 population and over as coming under the urban classification.

For the State as a whole, the percentage spent in the food group is 25 per cent, in the automotive group 17 per cent, and in the general merchandise group 16 per cent. In the Pittsburgh area as a whole, these percentages are 27 per cent, 17 per cent and 17 per cent respectively. In the area excluding Pittsburgh and McKeesport, the percentage spent in the general merchandise group drops from 16 per cent to 8 per cent. In the city of McKeesport it is only 9 per cent. Note, however, that in the city of Pittsburgh the percentage jumps from 16 per cent to 27 per cent, which we interpret as meaning that the general merchandise business flows from outside the city to the city of Pittsburgh itself but that the bulk of the purchases in the food and automotive groups are made locally. Obviously, some increase will be shown in the food and automotive group percentage in the area outside of Pittsburgh and McKeesport due to the purchases of general merchandise being made in the city of Pittsburgh. However, the percentages decrease for the city of Pittsburgh proper in these two groups. The accompanying table shows a similar analysis in a number of representative areas in which detailed information is available. Some of these areas can be considered as urban, rural, and some pretty well divided as to urban and rural populations. An examination of these figures shows that the same condition obtains in all the areas to a greater or less extent, which strengthens the interpretation that the major portion of the business that flows to the shopping centers consists of general merchandise and apparel lines.

DISTRIBUTION BY KINDS OF BUSINESS
NET SALES (1929) IN PER CENT OF TOTAL SALES

AREA OR CITY	FOOD GROUP	AUTOMO- TIVE GROUP	MERCHANDISE GROUP	APPAREL GROUP
*Philadelphia Area Total	24.65	12.47	20.72	11.33
Philadelphia City	23.25	10.39	23.67	12.45
Chester City	29.15	18.66	10.61	10.68
Norristown City	27.74	21.52	12.50	10.31
Balance of Area	32.40	23.65	4.61	4.42
*Pittsburgh Area Total	26.80	16.54	17.05	
Pittsburgh City	22.89	12.75	26.82	
McKeesport City	32.20	14.78	8.97	
Balance of Area	30.21	20.26	8.20	
Allentown, Easton, Bethlehem Area Total	23.29	19.94	12.69	10.20
Allentown City	20.27	19.95	17.46	12.36
Easton City	21.91	15.02	19.62	12.72
Bethlehem City	27.69	19.01	8.21	11.83
Balance of Area	26.63	24.44	2.00	3.38
Reading Area Total	21.66	20.55	10.72	9.50
Reading City	20.82	19.26	14.16	12.72
Balance of Area	23.88	23.96	1.62	1.00
Lancaster Area Total	17.39	21.29	11.29	6.87
Lancaster City	16.72	21.22	19.97	10.45
Balance of Area	18.09	21.37	2.11	3.09
Erie Area Total	24.56	22.83	10.49	10.59
Erie City	23.98	22.29	12.25	12.26
Balance of Area	26.64	24.78	4.02	4.45
York Area Total	20.45	21.40	11.87	7.67
York City	19.61	20.51	17.64	11.39
Balance of Area	21.48	22.45	4.90	3.19
New Castle Area Total	25.51	22.12	9.91	10.41
New Castle City	23.83	22.27	11.60	11.78
Balance of Area	29.87	21.75	5.52	6.86
Williamsport Area Total	24.31	21.00	10.40	11.33
Williamsport City	23.88	20.11	13.66	13.65
Balance of Area	25.50	23.45	1.49	5.00
Gettysburg Area Total	19.28	22.18	4.68	
Gettysburg City	18.72	22.52	8.01	
Balance of Area	19.69	21.92	2.24	

*With exception of Bucks Co. Due to lack of detailed information

*With exception of Armstrong & Greene Counties. Due to lack of detailed information.

In other words, the family food basket is filled in the home markets. Automobiles which are sold at fixed prices are bought at agencies convenient to home. Miscellaneous purchases are bought locally or in the suburbs where there is convenient parking space. National advertising and our contacts with the cities, have made us style conscious and we prefer to do our shopping in the city for clothes, curtains, furniture, rugs, pianos and such other finer merchandise, purchases are made only after mature deliberation.

Influences Working Toward Changes

We have attempted to outline the extent of the merchandising business of the State as well as show a break down to the various natural territories in which it is conducted. It is of interest to mention the influences that have been at work in shaping up the changes that can be expected to take place in the future and to visualize, if possible, their extent.

Certain basic changes in the various retail shopping areas that have been going on are due to population changes in the last 30 years, both as to total population and the differences in rate of growth of urban and rural populations. In the decade from 1900, the total population of the State gained 21.62 per cent, the urban population gained 34.28 per cent and the rural gained 6.34 per cent.* From 1910 to 1920, the

gain of total population was 13.76 per cent, that of urban
*All incorporated places having 2500 or more inhabitants are classed as urban areas.

21.10 per cent and rural 2.56 per cent. From 1920 to 1930 the gain in the total population was 10.45 per cent, that for urban 12.83 per cent and for rural population 6.15 per cent. A decided growth in the urban population has been at the expense of the rural population. However, in the past depression years some changes have taken place in these trends. According to the 1933 Census, populations in both Philadelphia and Pittsburgh have decreased somewhat. This condition also has obtained in many of the cities of the second class. Cities of the third class, 30,000 down to 5,000 population, have about held their own while in districts of 5,000 and under, there has been some increase. Trends in population obviously are based on data covering many years, so it is difficult to determine the degree of permanency of these deviations just cited or what effect they will have on the trend. We have seen in the analysis of specific retail shopping areas the large portion of the general merchandise and apparel business which flows to the shopping center city from the rural districts. From the viewpoint of population changes alone, as time goes on, the business placed by rural purchasers will continue to grow but will be a less share of the total and dependent on other factors than population growth.

Changes in the general makeup of populations affect the markets in the areas as a whole. Different groups of the populations have different wants and changes in their size and condition affect the purchasing power in their area.* The effect
* See Greater Pennsylvania Council Soft Coal bulletins.

of the changes in the Pennsylvania bituminous coal mining industry may be cited. The State has been losing her market steadily. From 1925 to 1930, 65,000 Pennsylvania miners lost their jobs with a corresponding loss of purchasing power in such areas as Pittsburgh, DuBois and Johnstown. A similar situation exists, not to as great an extent, in the anthracite fields where competition is being severely felt from other fuels.

Unemployment resulting from the mechanization of industry in the past years will be an important factor in the manufacturing and mining areas. This is especially true if these workers are not assimilated into other occupations and relief must be carried on on a wide scale in the future.

Changes in styles affect whole manufacturing districts with resulting shifts in occupations and population.* Frederick F. Stephan, Director, Bureau of Social Research, has made an interesting analysis of the effect of population changes in the Pittsburgh market.

The retail shopping areas are territories in which large portions of certain types of the merchandising business flow to the shopping center city. The shaping up of these definite areas has been due to influences that long have been at work. The shifting of trade in certain lines of merchandise away from the country stores and small town stores to the country seats and cities has been going on for many years but it has

*Population Trends Predict the Future of Pittsburgh and the Pittsburgh Market by Frederick F. Stephan, Director, Bureau of Social Research. Federation of Social Agencies, Pittsburgh, Pennsylvania.

been particularly marked since 1920. Some of the shopping center cities have been losing trade to the large stores in the metropolitan districts but this shift has been less marked than the changes in the areas themselves. During this period some shifts have been taking place in the opposite direction but in a less marked degree. Limitation of parking facilities led some stores to establish suburban branches. Mail order houses may have sensed a falling off in catalog sales in opening up their chain retail stores. Suburban department stores, roadside stands, gasoline filling stations with their increasing lines of merchandise, can be mentioned as some of these. When the detailed figures of the 1933 Census of Distribution are available, some definite figures on the changes can be worked up for the years intervening since the 1929 Census. Enough local investigations throughout the country have been made, however, to convince us definitely that a continuous shift to the cities is being made in general merchandise and apparel lines or in general what might be termed fashion goods.

The basic cause of the shifting of purchasing and the formation of well defined shopping areas has been the increased use of automobiles (including trucks) and the development of good road systems. Supplementary to these causes was the growth in popularity of motion pictures and radio advertising. The people have become style conscious, generally Rural folks now go to the larger towns to shop and visit the motion picture houses and to see the displays of good merchandise. Consequently the lag in

the spread of styles from the city to the country is lessened. Instead of drawing their rural trade from a radius of five or six miles, the urban stores now get business from distances of thirty miles and more and the change is still going on. Automobile speeds have been increasing with a corresponding increase in distances traveled. This applies, too, to the radius of urban store truck delivery.

The tendency of retail trade to concentrate in a smaller number of centers has contributed to the growth of the chain store system and we believe this growth will be continued. This growth has been more rapid in some areas than in others as shown in the following tabulation:-

Per cent of Total Sales by Sectional and National Chains in Selected Areas

Area	% of Sales by Sectional and National Chains
Pittsburgh	19.17
Scranton	16.85
Altoona	15.14
Philadelphia	13.20
York	10.44
Lock Haven	9.65
Gettysburg	3.81

Future Tendencies

The Sales tax, as adopted by various states and suggested for the Commonwealth, may have a marked effect on retailing. Such a tax has a tendency to bear more heavily on the smaller incomes proportionately, if the retailer passes on the tax. If he is unsuccessful in doing so, his profits are affected notice-

ably. The effect on retailers near states having no such tax would be felt even more.

Another factor that may have an effect on retail merchandising is the Federal policy of farm crop control. It is too early as yet to determine any possible tendencies but they may be far-reaching.

The recent general decline in the price level and increase in operating expenses caused by added customer services without increased volume makes maintenance of an adequate profit by the retailer extremely difficult. He is now confronted with the problem of increasing prices or reducing expenses in a highly competitive field, and at present it does not seem probable that the public will be very willing to absorb higher prices.

General advertising is another problem which may receive some overhauling in the future. Higher competitive business conditions have colored the advertising of some retailers to such an extent that many customers are beginning to feel some one is lying. One of the tasks of retailers is to re-establish confidence in their advertising.

In such a time as the present forecasts of coming developments or the course the volume of merchandising sales will take in the future are extremely hazardous.

We are fairly sure that in the coming decade the present types of retailing will be maintained, but the possibility that new kinds may come into being always exists. This obviously is problematical. Neighborhood community shopping centers with

specialized stores are likely to increase. Chain stores, such as grocery and combination grocery and meat stores, may add delivery and credit. There appears to be some tendency along this line at present. "Serve yourself" chain stores may increase in numbers.

One thing likely to take place is that retailers will more and more absorb college graduates in their personnel, paralleling the practice of engineering companies. The turnover in personnel now is very high.

In attempting to visualize the volume of retail sales over the past years, we are confronted with the situation of having no official and comparative data, so that results we obtain must necessarily be considered approximate. We have as definite figures the results obtained in the 1929 and 1933 Censuses of Distribution. Figures for other periods we must estimate from such other sources, such as reports of retail mercantile business in connection with mercantile licences.*

These figures indicate a retail business by 1944 of approximately \$5,000,000,000, on the basis of the 1923-25 price level, an average annual increase of 4.5 per cent from the present level. Such a conclusion is subject, of course, to a return of prosperity, an increase in real wages and a resumption of the rising trend in real income characteristic of the period from

* Productive Industries -- Public Utilities -- Miscellaneous Statistics. Pennsylvania Department of Internal Affairs -- Bureau of Statistics.

1922 to 1929.

If, however, estimates of future population appearing in other parts of this report are taken into consideration, then possibly the estimate for 1944 will be considerably lower, perhaps as much as 20 per cent.

The outstanding accomplishment of American industry in the post-war period has been the remarkable development of production facilities. During these boom years of consumer demand no necessity appeared for a high degree of scientific distribution so that costs and methods did not keep pace with the development in production. We have now entered a period in which constructive merchandising ability only can survive. Human desires know no limit and the years of depression have developed a pent up demand that craves to be satisfied. To reach the greatest number of consumers, distribution costs must be lowered. American ingenuity has solved the production problem, and that it will solve the many problems confronting retailers, we are quite sure.

TRANSPORTATION IN PENNSYLVANIA*

This survey of the transportation facilities of the Commonwealth aims to serve three purposes: To sketch briefly existing transportation facilities in Pennsylvania; to indicate the need for coordinating them into a more harmonious and effective system of transportation; and to indicate the need for further quantitative and qualitative study of these facilities, their coordination and their adequate constructive and comprehensive regulation.

These matters should not be left to fortuitous development, but should be studied in the interests of the public and the development planned so as to conserve investments already made and those to be made in the future, to guard against ruthless and destructive competition among these public service enterprises, and to conserve employment for citizens of the State who earn their livelihoods in these enterprises.

The conservation, coordination and regulation of transportation facilities is a pressing problem in economic, governmental and social planning in which the states and Federal government should cooperate.

RAILROADS OF PENNSYLVANIA

Pennsylvania is served by 11,106** miles of railroad

* Developed in cooperation with G. Lloyd Wilson, Ph.D., Professor of Commerce and Transportation, University of Pennsylvania.

** 1932 mileage

operated by 18 systems, controlling 109 subsidiary lines.

Four and one-half per cent of the country's railway mileage lies within the State and there is .245 mile of railroad per square mile in Pennsylvania compared with .066 for the United States as a whole.

Figures are not available as to freight or passengers carried by railroads in Pennsylvania. The population of the State, however, was 7.8 per cent of the total for the Nation in 1930, its income approximately $8\frac{1}{2}$ per cent, and its value of manufactured and mineral products about 10.6 per cent of the Nation's total. It is the "Keystone" railroad State, for passengers and freight pass through from the North, South and West. Exports and imports also move through the ports of Erie and Philadelphia in considerable quantities.

It would be reasonably safe to estimate that 70,000,000 tons of originating freight or 150,000,000 tons of revenue traffic were carried by the railroads of the State in 1933. In addition, 44,000,000 passengers traveled within the State or passed over its borders in the same year. These figures show a sharp decrease from the peak in 1929.

HIGHWAY TRANSPORTATION

Practically 7 per cent of all motor vehicles in the United States were registered and operated over the highways of Pennsylvania in 1933. On November 30, 1934, there were 1,475,524 private passenger cars, 5,704 buses and 258,220 commercial trucks and tractors, or a total of 1,738,948 vehicles. The

November, 1934, registration showed the first increase since the peak registration of 1930.

Pennsylvania has approximately 16 motor vehicles to every mile of highway, while the country as a whole has but half that number. It must be realized, however, that urban centers such as Philadelphia, Pittsburgh and Scranton have much greater density than the mean of the State. Likewise, certain routes of travel are more highly congested.

Between 6,000 and 7,500 truck operators hold certificates of public convenience and necessity in Pennsylvania and it is estimated that they operate between 7 and $8\frac{1}{2}$ per cent of all the registered commercial freight vehicles. Eighty per cent of all passenger vehicles, exclusive of private automobiles, are common carriers.

Early Pennsylvania Highways. The early highways of Pennsylvania had their origin in the post roads and the local roads of colonial days, whose locations were controlled by the ridges, mountains and valleys that run from the south to the northeast section of the State. The industry of its people also has directly affected, from the earliest days, the location and the density of roads.

Late in the Eighteenth Century and far into the Nineteenth toll roads and turnpikes were built and operated by private companies. The first turnpike in Pennsylvania and one of the first in America was built from Philadelphia to Lancaster, a distance of $62\frac{1}{4}$ miles. It was the Lancaster Turnpike, built

and operated by the Philadelphia and Lancaster Turnpike Road Company. This road was completed in 1794 at a cost of \$465,000, or approximately \$7,516 per mile.

By 1831 there were 2,500 miles of such roads in the State, including the Downingtown, Ephrata and Harrisburg Turnpike, otherwise known as the "Horseshoe Pike," the Little Conestoga, York Road, the Strasburg Road and the National Pike. The decade of the 1840's and the period after the Civil War saw large increases in the mileage of turnpikes and toll roads.

The early toll roads were of corduroy, plank or broken stone construction and later of macadam. Lack of maintenance caused many to be abandoned. Most of the roads did not pay and almost without exception eventually proved to be unprofitable ventures.

The decline of toll roads was due to the expansion of steam railroads and electric railways which diverted long-distance travel from the highways to the rails, and partly because of the unpopularity of highways which were not free to the public.

Another period of road development came with the advent of the bicycle and later the automobile. Highway growth was both the cause and effect of the development of the motor vehicle. Pennsylvania was the eleventh state to take up highway improvement. In 1903, the Pennsylvania Department of Highways was organized but it did not have the supervision of the State highway system until 1912.

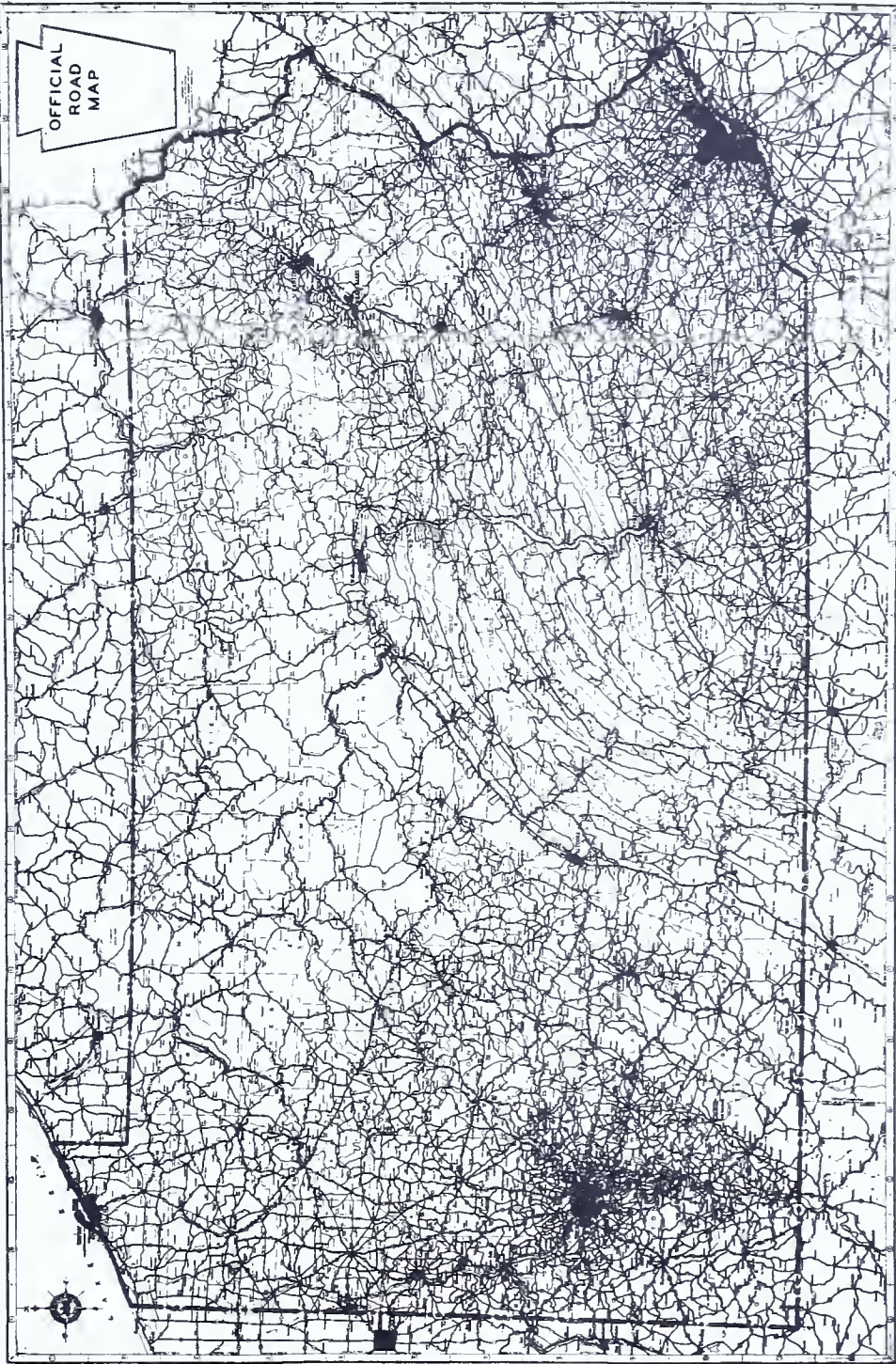


FIGURE NO. 101

Present Highways.

Pennsylvania in 1933 had an average of 2.29 miles of highways for every square mile of its area, compared to approximately .87 miles for the United States as a whole. There were 103,591 miles of improved and unimproved State Highways, rural roads and city streets on May 15, 1933, as shown by the following table:

Type of Road	Surfaced and Improved	Unimproved	Construc- tion of base only	Total
State Highway	12,130	1,335		13,466
Rural Roads	8,343	10,452	1,375	20,170
State & City Sts.	65			65
Connecting Highways	306	2		308
All other Highways	15,342*	54,239*		69,581*
Total	36,186	66,028	1,375	103,590*

*Mileage as of July 1, 1929.

A more recent inventory showed 35,414 miles of State Highways, State aid highways and rural roads, of which 10,532 miles were unimproved and 24,882 surfaced and improved.

Use of Highways

Highways of Pennsylvania have generally been constructed to accommodate passenger vehicles and moderate weight trucks. The problem of providing highways for heavily loaded vehicles must be considered in the light of the interest of the entire

public.

Vehicles of weights in excess of the limits for which our present roads were constructed should be denied the right to operate upon Pennsylvania highways. The planning of future highways, however, should consider the limits of weight, together with the size of vehicles. Planning, too, should be combined with the fact in mind that Pennsylvania's highway system and the vehicles operating over it are part of a National system and that it would be preferable to have uniform regulation of size, weight and speed.

Roadside Improvements

Accomplishments of the Forestry Unit established in the Highway Department in 1928 have shown that roadside improvement pays for itself in lowered maintenance costs and that consideration should be given to betterment of rights-of-way.

Roadside improvement is becoming recognized as an essential element of highway construction. Today the emphasis is upon utility, elimination of traffic hazards and cutting of upkeep costs, but at the same time beautification has been by no means forgotten.

Planting of trees, shrubs and vines, together with sodding and seeding, check erosion of steep slopes and in many instances prevent it. Thus maintenance costs are reduced. Traffic hazards have been eliminated by trimming and pruning trees on the sides of curves for clear vision. Dead and dangerous trees have been removed to promote safety but in every in-

stance effort has been made to spare the existing desirable growth.

The last report of the Highway Forestry Section showed that more than 2,000,000 trees, shrubs and vines had been planted, nearly 8,000,000 square feet seeded and sodded, 31,827 dead trees removed, 103,801 trees pruned and trimmed, 165,642 caterpillar nests destroyed, 114 scenic views opened, 11,354 stumps and snags removed and a vast amount of other work accomplished, such as spraying and transplanting in the past five years.

Erosion has been controlled on many slopes, and in some specific cases maintenance charges have been reduced from \$600 to \$10 a year. An unusual feature has been the trimming of trees to obtain circulation of air, so that the roadway may dry quickly, thus aiding the elimination of ice and slippery roads.

Permanent live evergreens have been set out as "snow fences" at points along the highways where snow drifts frequently occur. These snowbreaks have replaced the wood and wire fences ordinarily used and should greatly reduce maintenance costs. The Forestry Unit estimates that if they were substituted for all of the State's present mileage of wooden fence, the saving would approximate \$500,000 a year.

The first allocation of National Highway Recovery Funds to Pennsylvania's roads amounted this year to approximately \$18,000,000 and the second to about \$9,500,000. Of the first

amount, \$94,500 was set aside for roadside development projects, and of the second, \$98,798. The program provided for work on virtually every major route in the State. Exclusive of these funds, the Commonwealth has averaged \$125,000 per year for the past five years for roadside development.

The Forestry Unit points out that some revision of the laws governing removal of trees, signs and other obstructions at dangerous points along the highways is desirable in the interests of traffic safety. Rights-of-way previously obtained for the main highways have been too narrow, in general. Future traffic needs on each route should be considered, particularly with regard to the probability of future surface width and a landscaped area safely beyond the space required for any future widening. Narrow rights-of-way have been responsible for high costs of surface widening and often have made landscaping impossible.

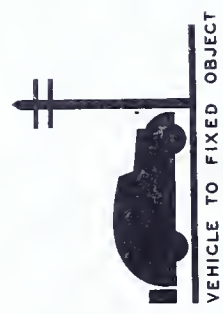
Rights-of-way can be purchased now at lower prices than will be possible in the future, according to indications. On main highways, a right-of-way not less than 150 feet wide seems desirable to meet probable future requirements. Obtaining so great a width may not always be practicable because of buildings or other improvements, however. In some places considerably greater width may be needed, especially where opportunity exists for a particularly effective landscape development, such as the preservation of a natural grove or where screening material should be planted to hide an unsightly area.



VEHICLE TO VEHICLE



VEHICLE TO PEDESTRIAN



VEHICLE TO FIXED OBJECT

**TYPES OF AUTOMOBILE
ACCIDENTS**
FIRST 9 MONTHS OF 1934

EACH FIGURE = 4000 ACCIDENTS



PLANNING
BOARD

FIGURE NO. 102

The Forestry Unit has drawn up a plan for planting work in all counties. The program is designed to protect the enormous investment the State has in its highways. The immediate plan shows a total of 4,660 sites for trees, shrubs, etc., and 1,889 soddings and seedings proposed. The number of square feet needing treatment is placed at 2,208,118 and the total cost \$951,411.

Motor Vehicle Accidents

Motor vehicle accidents, ranging from 40,000 to 48,000 each year since 1929 on the highways, roads and streets of Pennsylvania, resulted in 1,900 deaths and 35,000 to 47,000 injuries and millions of dollars in property damage. They provide a major reason for highway planning and control by the Commonwealth and local governments.

Collisions with motor vehicles, pedestrians and fixed objects are the three most important types of accidents and cause the greatest number of deaths and injuries. Approximately 55 per cent of the accidents result from operator violations, of which driving too fast under prevailing conditions of weather, traffic and roadway; driving or parking upon the wrong side of road; forcing vehicles from highway; failure to stop at "through streets," and "cutting in" are the major infringements.

A surprising proportion of these accidents occur upon dry roads in clear weather, when the vehicle is going straight. Street intersections, straight stretches of rural road,

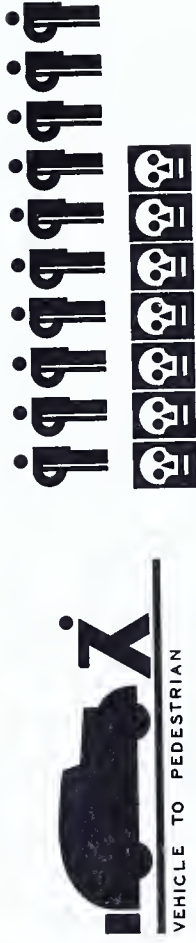
sections between street intersections, and curves are the most dangerous parts of the State's street and highway system. But one of the greatest hazards is a human one. Inattention of both operator and pedestrian account for a large percentage of the fatalities and injuries.

Operator violations, mechanical defects of vehicles, and actions of pedestrians, among others, can be corrected in some part by strict enforcement of motor laws and regulations, education of the driving public and the pedestrian, and the construction of highways which will reduce to the greatest degree the human element or "moral hazard."

Accident statistics hold the key to accident prevention. These statistics, however, should be improved and be made in greater detail than at present to provide a real means of attack upon the problem.

Inaccuracies in information resulting from reports filled out by persons involved in accidents should be corrected by having the reports prepared by local authorities and forwarded by them to a central government agency. Discrepancies would then be less likely to appear.

It is also possible that more detail and complete analyses of these reports would point out other means of attacking the accident problem. During the first ten months of 1934, for example, there were 5,025 accidents on curves resulting in death to 125 persons and injuries to 2,729. Only 246 of the accidents on curves, causing three deaths and 126 injuries,



INJURIES AND DEATHS BY TYPE
OF AUTOMOBILE ACCIDENT
FIRST 9 MONTHS OF 1934

EACH FIGURE = 1000 ACCIDENTS



resulted from operator violations, however. What were the causes of the other 192 deaths and 2,483 injuries?

Statistics for the same period show that approximately 45 per cent of the accidents cause five-eighths of all motor deaths and one-third of all injuries. How many of these accidents were caused by the condition of vehicles, the weather, the condition of road surface, actions of pedestrians, sleeping drivers, obstructed view, excessive light, possible faulty road construction such as unbanked curves, narrow lanes and the like, and avoidable and removable hazards along the rights-of-way?

Analyses such as these should further facilitate accident prevention upon existing highways and permit road engineers and designers to construct and design future highways with greater understanding of the types necessary for the safety of the driving public.

OCEAN TRANSPORTATION

Pennsylvania, although not directly on the ocean, has one major ocean port where ocean-going vessels may load and discharge cargoes and passengers. Philadelphia is situated on the Delaware River, a navigable waterway that empties into the Delaware Bay and thence to the Atlantic Ocean - a distance of 101.7 miles by water. The northwest boundary of the State borders on Lake Erie, one of the Great Lakes, where the City of Erie is a port for foreign and coastwise commerce.

There are 71 steamship companies, with lines serving the

entire world, that dock their vessels at Philadelphia. The total commerce entering and leaving Philadelphia in 1933 was 21,140,221 long tons, an increase of more than 2,000,000 tons since 1929. Erie, with a total of 3,326,174 long tons in 1933, also increased its 1929 figures by almost 1,000,000 tons.

Of the four types of shipping service in Philadelphia (foreign, intercoastal, coastwise, and noncontiguous), coastwise shipping had the greatest amount of tonnage, with 15,396,969 long tons in 1933. The trade of Erie, divided between coastwise and foreign, was almost 70 per cent coastwise in 1933.

Passenger service also was rendered by the steamship carriers in both Philadelphia and Erie. Although entire figures are not available for all passenger services, the ports of Philadelphia and Erie had a total of 567 persons in 1932 either departing for or arriving from foreign ports. This was a considerable decline from 1929, when 9,143 persons entered or left the State by the two ports. Steamship lines also provide tourist cruises to foreign, intercoastal and noncontiguous points from Philadelphia and Erie.

INLAND WATERWAYS

Pennsylvania has an inland waterway system which totals approximately 622.7 miles in length. Five rivers and two canals comprise the navigable water routes and touch only the East and West portions of the State. The waterways and their individual navigable lengths are:

	<u>Miles</u>
Lehigh and Delaware Division Canals	68.00
Schuylkill Canal	90.00
Delaware River (Philadelphia to Trenton)	33.7
Chester River	.....
Allegheny River	255.00
Monongahela River	131.00
Youghiogeny River	9.00
Ohio River (Pittsburgh to border of Penna.)	<u>36.00</u>
Total	622.7

The great majority of the tonnage transported consisted of bulk products, such as coal and other mineral or low grade products which did not require expedited services and were shipped in such large quantities that low cost was the primary consideration.

From 1929 to 1931, there was a steady decline of inland waterway traffic, dropping from a total of 38,628,065 short tons in 1929 to 23,124,264 short tons in 1931. This was a loss of 15,503,801 tons over a three-year period. Package and merchandise freight also experienced a similar drop, from 1,842,601 short tons in 1929 to 117,955 short tons in 1931, a loss of 1,724,646 short tons in three years. The following table gives statistics in short tons for all inland waterways of the State:

<u>YEAR</u>	<u>BULK FREIGHT</u>	<u>PACKAGE FREIGHT</u>	<u>TOTAL</u>
1929	36,785,464	1,842,601	38,628,065
1930	34,981,175	102,912	35,084,087
1931	23,006,309	117,955	23,124,264

The central portion of the State, though served by the Susquehanna River, has not had its facilities developed on a navigable basis by canals or simple river improvements. Therefore, at present water transportation is completely denied the central section of the State.

The decline in package freight undoubtedly is due to the inroads of swifter forms of transportation, arising out of the increase in hand-to-mouth buying and the need for rapid movement of that class of freight. However, bulk freight does not come under that category and should be shipped, when not perishable, over the most economical route that is available. Inland waterway development should be considered with a view to providing a transportation facility that is economical when all costs are considered.

The Allegheny River is now being improved so that it shall be navigable to the New York State line.

PETROLEUM PIPE LINE TRANSPORTATION

Pennsylvania is the Keystone State in the pipe line structure of the United States. As a producer of petroleum of almost 12,000,000 barrels per year, Pennsylvania necessarily has an intricate system of intrastate lines from its oil fields to its refineries. However, every trunk line of the country which moves from the western fields to the eastern seaboard, enters the State.

Thirteen major pipe line companies, which operated lines either through or within the State in 1933, had a total mileage

of 9,514 in Pennsylvania. This figure does not include the mileage of numerous other small intrastate pipe lines, average length of which was less than five miles. Of the 13 companies, only five reported an interstate business, although the majority of the remaining eight lines reported that much of their traffic was gathered from or for other lines doing an interstate business. The majority of the lines, therefore, may be considered parts of through interstate systems.

During 1931, the 13 companies carried a total of 44,518,107 barrels of oil and 4,545,140 barrels of gasoline. These figures do not allow, however, for overlapping in totals, for in some instances intrastate carriers emptied their lines into those of interstate carriers or larger intrastate carriers, and in this manner the total would show the same shipment in the figures of two or more companies.

A table of the major companies, their mileage and their service follows:

COMPANY	MILEAGE	BARRELS CARRIED 1931
<u>OIL</u>		
National Transit Co.	3,800.84	959,840
South West Penna. Pipe Lines	1,925.74	12,194,267
Valvoline Oil Co.	956.80	959,840
Bradford Transit Co.	630.00	3,958,559
Tide Water Pipe Co., Ltd.	592.00	5,459,771
Tuscarora Oil Co., Ltd.	13.33	4,905,151
Southern Pipe Line Co.	261.00	9,536,520
Pure Oil Pipe Line Co.	56.66	676,185
Vacuum Oil Co.	40.33	2,254,488
Elk Oil Co.	20.00	32,050
Franklin Pipe Co., Ltd.	5.00 (app.)	27,972
TOTALS	8,301.70	44,518,107

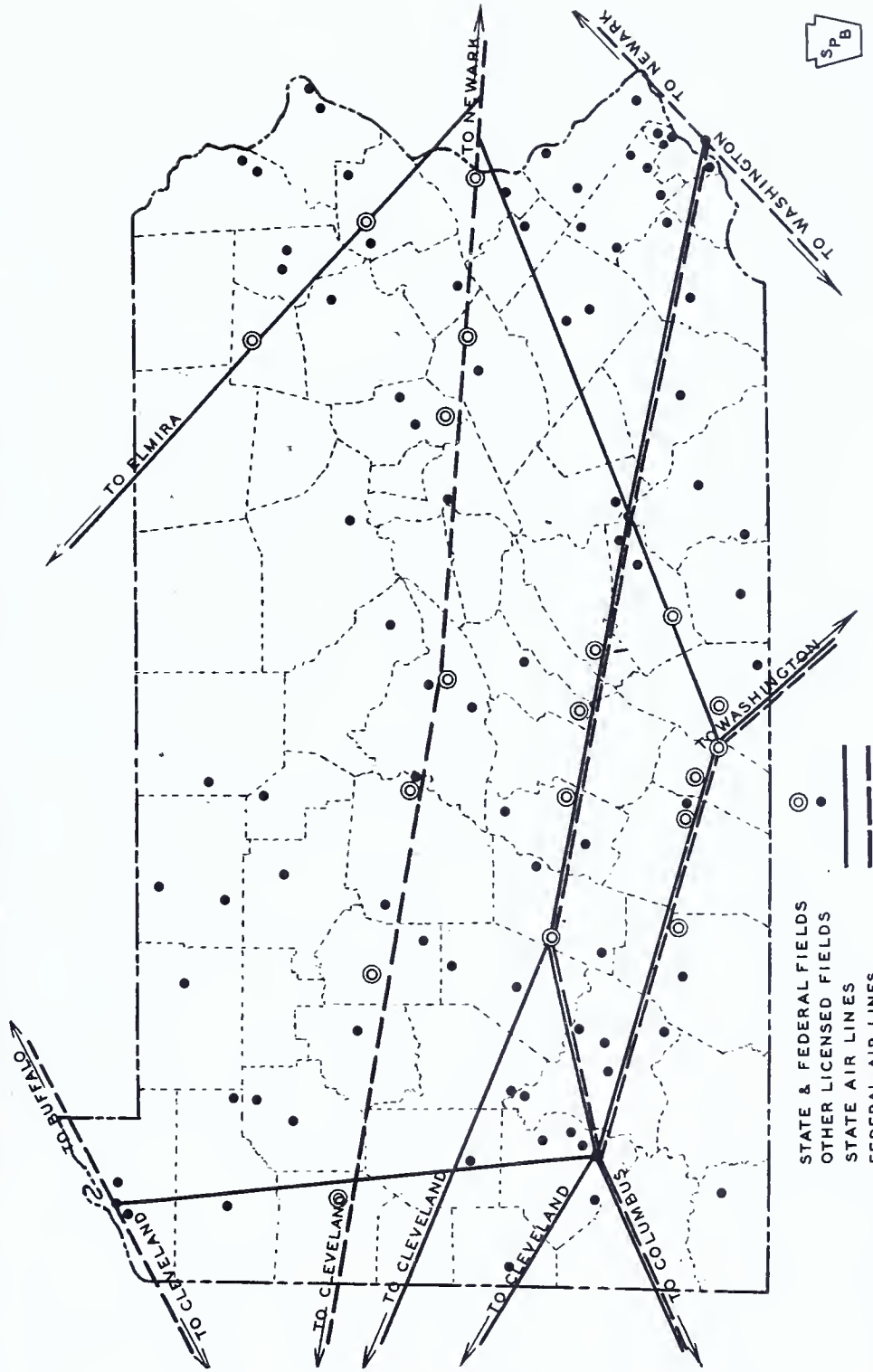
<u>GASOLINE</u>		
Susquehanna Pipe Line Co.	546.60	2,422,288
Tuscarora Oil Co., Ltd.	440.50	2,017,837
Keystone Pipe Line Co.	225.90	105,105
TOTALS	1,213.00	4,545,140

Pipe line transportation, when studied for either regulation or planning, presents two characteristics unusual to agencies of transportation. First, pipe lines are restricted to the transportation of a single commodity - petroleum. Second, pipe lines usually are integrated portions of a large industry - oil refining - and as such can be entirely regulated only through regulation and supervision of the other related portions of the industry.

COMMERCIAL AERONAUTICS

Air transportation in Pennsylvania has been developed to a considerable extent on a planned basis. There are six main

AIR LINES - LICENSED AND EMERGENCY FIELDS



STATE & FEDERAL FIELDS
 OTHER LICENSED FIELDS
 STATE AIR LINES
 FEDERAL AIR LINES
 PENNA. DEPARTMENT OF REVENUE,
 BUREAU OF AERONAUTICS



FIGURE NO. 104

airways that directly cover the State and also one airway that indirectly serves the area through the medium of the Central Airport of Camden, N. J. All are lighted for day or night service and are traversed by five of the major air transport companies of the United States, namely, the Pennsylvania Air Lines, Inc., Transcontinental and Western Air, Inc., American Airlines, Inc., United Air Lines, Inc., and Eastern Air Transport, Inc.

These airways are maintained either solely by the State or Federal governments, or jointly by both agencies. Beacon lights spaced at ten to 15 mile intervals and intermediate landing fields from 30 to 50 miles apart are among the aids to air navigation established on the Federal airways system by the Aeronautics Branch of the Department of Commerce. In establishing intermediate fields, the Aeronautics Branch so arranges them that they serve in conjunction with airports and other landing fields lying along the airway.* The State Aeronautics Division is proceeding in the same manner with the airways under its supervision. At present, plans are under way for the building of seven emergency landing fields, one of which is now under construction.

The number of licensed aircraft in the State increased, except in 1934, and the number of unlicensed declined. Between June 30, 1929, and July 1, 1934, the total number of

*General Airway Information - Airway Bulletin No. 1, United States Department of Commerce, Aeronautics Branch, Washington, D. C., September 1, 1932.

aircraft in the State increased from 361 to 490, with 144 being licensed in the latter year. The number of pilots also increased, during the same period, from 265 to 719. The peak year of 1932 saw 1,037 licensed pilots in the State. From July 1, 1930, to July 1, 1933, the number of airports and landing fields in Pennsylvania increased from 85 to 111. Of these, 38 were partially lighted or fully lighted on the latter date.

Commercial airports and landing fields are inspected and licensed by the State Department of Revenue, Division of Aeronautics. This body also supervises the requirement of Federal licenses for aircraft and pilots, a rule that is part of the Aeronautical Code of Pennsylvania, enacted in 1933.

Pennsylvania is served by the commercial air transport companies with every available air service. The five large transport lines all give passenger and express service while four have United States air mail contracts. Coordinated air-motor express service is given by one air line and the Railway Express Agency. They make overnight delivery from Philadelphia to the Pacific Coast. Although air transportation is potentially for long distance or interstate travel, there is little provision for intrastate movement. Because of the few scheduled commercial air stops in the State, direct air travel to or from any point within the State to or from points elsewhere is limited.

Commercial aviation is being regulated and controlled to

a great degree by uniform State and Federal legislation. Thirty-three states have laws similar to Pennsylvania and practically all states follow either identically or closely to Federal regulation. Due to the large overhead expense, most states also leave licensing to the Federal government.*

ELECTRIC RAILWAYS

The electric and street railways of the State, with 56 separate operating companies listed as of the calendar year 1931, showed a total of 3,227.42 miles of trackage in operation. This was an average of .0715 miles per square mile, as compared with an average of .0089 for the country as a whole.

The large cities of Pennsylvania are served by urban street-car lines, with elevated lines, subways, surface cars, and, in some instances, trolley buses. The interurban railway lines, many of the high-speed type, make cross-country runs between some of the larger towns. The State's electric railways operated 7,382 cars and employed 19,737 persons in 1931.

As was the case with many industries from 1929 to 1931, the patronage of the electric railways declined. In 1931, 1,247,308,128 passengers were carried on the electric lines as compared with 1,568,313,847 in 1929. This passenger traffic paid approximately \$72,000,000 in fares, or 88 per cent of the total income of the railways for 1931.

*Wilson, G. Lloyd, "The Transportation Crisis," Sears, New York, 1933.

Thirty-seven of the 56 railways carried some freight, milk or express, but the total revenue from such operations was only \$582,202.00, or .72 per cent of the total income for 1931.

Motor buses have either replaced or supplemented many of the electric railways. This change has occurred either from the inability of the railway to adapt itself to new conditions such as population shifts and the flexibility of the bus, or from the ability of the bus to offer more adequate service under certain circumstances and conditions.

The decline of the interurban electric railway, however, is not a new trend. It was generally well under way long before 1929. Several of the lines, however, have held their places in recent years by improving their service. These improvements in service may have a direct bearing on the future of electric railways.

COMPARATIVE TRANSPORTATION FACILITIES IN PENNSYLVANIA

Type of Facilities	Estimated Mileage in Penna.	Estimated mileage in the U.S.	Miles per sq. mile		Miles per inhabitant	
			In Penna.	In the U.S.	In Penna.	In the U. S.
Railroad	11,106.43	247,595.00	0.245	0.0662	0.0012	0.0020
Electric Rwy.	3,227.42	31,547.82	0.0715	0.0089	0.00033	0.00025
Waterway	622.70	27,366.00	0.0139	0.0092	0.00006	0.00022
Highway	103,590.58	3,040,000.00	2.29	0.866	0.0107	0.025
Airway	1,266.00	24,878.00	0.028	0.0066	0.00013	0.000202
Pipe Line	9,514.70	110,695.00	0.21	0.029	0.00098	0.00090

COORDINATION OF TRANSPORTATION FACILITIES

The orderly development of transportation in the interests of all forms of transportation and in the paramount public interest requires that attention be given by the carriers and by the public through the State administrative authorities to the coordination of the various instrumentalities of transportation.

The coordination of transportation, therefore, is the bringing of the agencies of transportation into the same order, the regulation and combination of all transportation facilities into harmonious action or relationship.

The coordination of transportation facilities implies the inclusion of rail, water, highway and air transportation agencies into a general system in which each type of carrier is on an equal basis with all other carriers, so that, by united action, they may render more efficient service.

The goal for all -- the operators of the railroads, the electric railways, the steamship lines, the motor carriers, the shippers and receivers of freight, and the public -- is the same. All are interested in adequate transportation service at rates that are fair to the producers and consumers of transportation.

The place of each transportation facility in a coordinated service should be determined by the relative efficiency with which each does its particular service. If it be definitely established that motor trucks haul freight and that motor buses transport passengers for short distances more economical-

ly than steam railroads, electric railways, steamship lines, or other carriers, then the development of motor transportation in short haul traffic should be encouraged and railroad, electric railway and steamship facilities should be devoted to hauling the steadily increasing volume of long haul freight and passenger traffic.

The coordination of transportation does not imply that the motor carriers will be relegated to a position of minor importance in the transportation system, or that motor truck and bus lines will all be controlled by railroads or by other carriers. Coordination, which implies only the union of various classes of carriers to improve the efficiency of transportation, may be achieved through independent ownership and operation of motor vehicles as well as through ownership and operation by railroads and steamship lines or by subsidiaries controlled by these companies.

Any uneconomical division of the field of transportation being brought about through the coordination of motor facilities with other transportation facilities should be avoided. The motor vehicle has become a permanent part of the transport system of this and other countries.

The coordination of the agencies of transportation may be achieved in a variety of ways:

1. By the direct ownership and operation of equipment for performing various types of transportation services by carriers already engaged in operating other types of transportation,

as, for example, the ownership and operation of motor trucks or motor buses by railroads or steamship companies.

2. By the organization of wholly-owned and controlled subsidiary companies to own and operate other kinds of transportation facilities such as the organization of subsidiary companies by railroads or steamship lines to perform highway transport services.

3. By the acquisition of financial interest in companies performing other types of transportation services, as typified by the purchase of the securities of motor truck or bus companies, steamship lines, express companies or air transport companies, by rail or other transportation companies.

4. By the establishment of agency arrangements between carriers of different types under the terms of which one carrier performs services which it can perform more efficiently as agent for the other contracting carriers, such as the transportation of freight by contract motor carriers as agents for the principals, the railroad or steamship companies, in cases where the goods can be transported more economically by motor vehicle than by rail or water.

5. By establishing joint routes, through rates and service and divisions of the single-sum rates among independent carriers of various types, as illustrated by joint rail-and-motor, or joint water-and-motor, or joint rail-water-motor services at through rates and joint billing arrangements.

6. By the organization of transportation companies

equipped to perform several or all forms of transportation services; rail, water, express, highway, air and pipe-line.

The Need for Coordination. - The need for the coordination of transportation facilities is urgent. The Federal Government has recognized the need and created the office of Federal Coordinator of Transportation through the enactment of the Railroad Emergency Transportation Act of 1933. The Federal Coordinator has created Sections of Transportation Service, Research, Purchasing, Car Pooling, Labor and Cost Finding, and regional coordinating committees and regional traffic assistants. The aim is to study the problems of coordinating transportation with the aid and cooperation of the carriers, in order to recommend to the carriers improvements in transportation services, facilities and practices and to recommend to the Congress legislation required in order to meet emergency conditions in the field of transportation and in order to improve the condition of transportation carriers and their usefulness, efficiency and economy to the industries and the public which they serve.

Reports of the Coordinator so far released have recommended the consolidation and coordination of railroad, express and freight forwarders' merchandise traffic; the pooling of railroad box freight cars into a national car pool, arrangements for the combined purchasing of certain types of railroad materials and supplies, and numerous other phases of transportation services and practices.

Coordination and Regulation. - The policy of the Public Service Commission of the Commonwealth of Pennsylvania with respect to the coordination and regulation of facilities of transportation has been stated in its decision in re Bingaman Motor Express Company, Docket A-9092, decided February 19, 1924. (P.U.R. 1924-C, 389):

"It has been the policy of the Commission to refuse to permit competition with existing utilities which have large investments and are necessary for public convenience, if their service is or can be made reasonably adequate. No transportation agency can render perfect service at all times to all persons. The Commission must consider the benefit to the general public. The use of motor trucks for transporting property has reduced considerably the receipts of railroad and electric railway companies. Although such motor service may be more convenient to some shippers than service by electric railway or railroad, consideration of public convenience will not permit the Commission to take action which will endanger the continued financial stability of such established roads."

Types of Coordination. The principal types of coordinated transportation service are to be found in the following arrangements: railroad-steamship, railroad-highway, railroad-steamship-highway, steamship-highway, railroad-electric railway, electric railway-highway, railroad-airway, airway-highway, railway-airway-highway, railroad-pipe line, railroad-pipe line-highway, steamship-pipe line-railroad-highway, steamship-pipe line, and pipe line-highway.

The use of motor vehicles in transportation services includes the following types of coordinated operations: branch-line, feeder, extension and connecting line services, supplemental services in periods of peak traffic, substitute services in times of off-peak traffic, alternating services with other forms of transportation, cross-country, terminal extension and terminal interchange services.

Motor vehicles also are used in substitute service for freight cars in intra-terminal industry-to-industry switching movements which are unduly slow and expensive when performed by railroad cars; as substitutes for freight cars in concentration and distribution services between major freight stations and sub-stations; as substitutes for railroad trap or ferry car services between railroad freight stations and industries' private sidings in terminal districts, and in substitute service for lighters, barges or car-floats at port terminals.

Motor vehicles finally are used as collection and delivery facilities for performing store-door freight services in connection with traffic moving via railroad, electric railway, express, parcel-post, freight forwarder, steam-ship or airway transportation.*

* Wilson, G. Lloyd "Coordinated Motor-Rail-Steamship-Transportation" Appleton, New York, 1930.

LEGAL RESTRICTIONS UPON COORDINATION**

Pennsylvania's transportation facilities are directly or indirectly affected by the provisions of the Interstate Commerce Act. The Act applies to common carriers engaged in the interstate transportation of passengers and property wholly by railroad, or partly by water when both facilities are used under a common control, management or arrangement for a continuous carriage or shipment. Likewise it applies to the transportation of oil by pipe line, or partly by pipe line and partly by railroad or by water.

Motor and air carriers are excluded from the Act, except where the motor is classified as a terminal facility,* and, therefore, are not properly parties to through routes and joint rates, covered by a joint tariff.

It is questionable also whether a railroad can legally transport property of its shippers by motor for a portion or all of the line-haul under the terms of a tariff and bill of lading providing for rail service. The interpretation of the Act is doubtful upon this point and difficulty might arise where the tariff does not indicate that the service is performed by motor or where the shipper does not desire his goods to move by highway.

** "Motor-Rail Coordination in The Freight Service," W. D. Gallo-way, Jr., M. B. A. Thesis, Graduate School, University of Pennsylvania, 1932.

Tariffs Embracing Motor Truck or Wagon Transfer Service, 91 I. C. C., 539.

All-highway service in lieu of all-rail movement likewise involves a serious problem of interpretation when the service is given at less than the rail rate. Should this be considered a "device" by which preference may be given to some shippers and a discrimination practiced against those availing themselves of the all-rail service, the railroads would be subject to severe fines. Although this may be stretching the point, doubt is well founded.

Another legal obstacle to coordination is provided by Section 7 of the Clayton Anti-trust Act, which declares that no corporation engaged in interstate or foreign commerce may acquire, directly or indirectly, all or any part of the capital stock of another corporation which is engaged in the same commerce where the effect of the acquisition would be to substantially lessen the competition, to restrain commerce in any section of the community or tend to create a monopoly in any line of commerce. Similarly, the acquisition of voting proxies of the stock issued by competitors is prohibited. The Clayton Act does permit, however, the organization of subsidiary companies by which the parent corporation may continue its immediately lawful business or branches of it when the effect is not to lessen competition substantially. Very often these subsidiaries result in savings to the parent carriers but do not affect true coordination in that they further duplicate equipment and service.

POWERS AND DUTIES OF
THE PENNSYLVANIA PUBLIC SERVICE COMMISSION

The Public Service Commission of Pennsylvania has the general administrative power and authority to supervise and regulate all public service transportation agencies, whether they be corporations or persons engaged for profit in the conveyance of passengers or property, or both, between points within the Commonwealth, by, through, over, above or under land or water, or both

The authority and power of the Commission includes the right to inquire into and regulate the following:

1. The services, rates, fares, tolls or charges, including individual and joint rates, but exclusive of the power to establish through routes and joint rates for the transportation of passengers over street railways, elevated railways and subways.
2. The repairs, alterations and improvements in and to such service as would be reasonably necessary for the accommodation or safety of patrons, employes and the public.
3. The grant of transfers upon the system of one carrier.
4. The routing of street railway lines.
5. The just and equitable distribution of trains, cars, vehicles and motive power or other facilities of all common carriers.
6. The grant, construction, operation or discontinuance of switches, sidings and crossings.
7. The construction, operation or discontinuance of switches or other connections with or between lines of railroads or street railways.
8. The location or abolition of freight and passenger stations, wharves, docks or piers.
9. Use and compensation for cars owned or controlled by persons other than carrier.

10. Safety, adequacy and sufficiency of its facilities, plant and equipment used to provide service.

11. Forms, methods and systems of accounts and records, with express provision that no charges be made to operating account that should properly be charged to capital account, and that depreciation accounts should be handled in a reasonable manner.

The Commission, in addition, may investigate interstate rates, facilities and services of common carriers operating within Pennsylvania. If these rates, facilities or services appear to the Commission unreasonable, discriminatory or preferential, or in violation of the Interstate Commerce law, or the rules, regulations or orders of the Interstate Commerce Commission, it may apply by petition to the Interstate Commerce Commission for relief. It may, otherwise, supply the Interstate Commerce Commission with all facts in its possession concerning the violations.

Much the same difficulties rest with the Pennsylvania Public Service Company Act as with the laws of many other States. The Act seeks to regulate the State's transportation agencies, but nowhere does it provide a means to obtain a well-integrated system of transportation. The Commission is so burdened with detail that the formulation of a comprehensive transportation policy by it, including the planning of coordination of transportation facilities is difficult.

Regulation based upon the concept of transportation of two decades ago, when the public found it necessary to be protected against the actions of the public service companies

and the companies against each other, can not meet the needs of the present. The Commission should have more time for research and planning in order to integrate the vast paralld, competitive and unintegrated transportation facilities of the State. Consolidation of the carriers and the coordination of the various instrumentalities should be considered to provide the State of Pennsylvania, its industries and people, with a requisite system of travel and transport.

CONCLUSION AND RECOMMENDATIONS

A detailed survey comprising the transportation system of Pennsylvania should be prepared. It is possible here only to sketch from available data the outlines and to suggest what should be done by State authority to improve the situation in the interests of the public, for the betterment of the conditions of all forms of carriers and the improvement of the services offered the public.

It is recommended that a descriptive and qualitative survey of the transportation facilities and services be made by a properly qualified commission appointed by the Governor, the Legislature or a Planning Board if created. Such a commission should recommend necessary legislation.

Public service company regulation in this State should be:

1. Comprehensive so as to include all of the activities of all types of public service companies.
2. Constructive so as to protect the interest of the public and conserve in good conditions all necessary public service enterprises serving the public.
3. Enforceable so as to afford adequate protection to the public and to the enterprises embraced in order that destructive practices and unfair charges may be effectively prohibited.
4. Adequately administered by a well organized administrative tribunal selected for the qualification of the members and free from undue influence from any group outside the body.
5. Properly related to the regulation of transportation by the United States Government.

ELECTRIC POWER AND ITS DEVELOPMENT

POWER RESOURCES.

Electrical power and its development are essentially a part of Pennsylvania. Considerable electric power is generated within the State for industrial, commercial and domestic uses. In 1927, almost 12,000,000,000 kilowatt hours or enough electricity to light 34,000,000 forty-watt lamps continuously day and night for one year were generated. The position of the Commonwealth in relation to four of the leading industrial states and to the United States as a whole is shown in the following table:

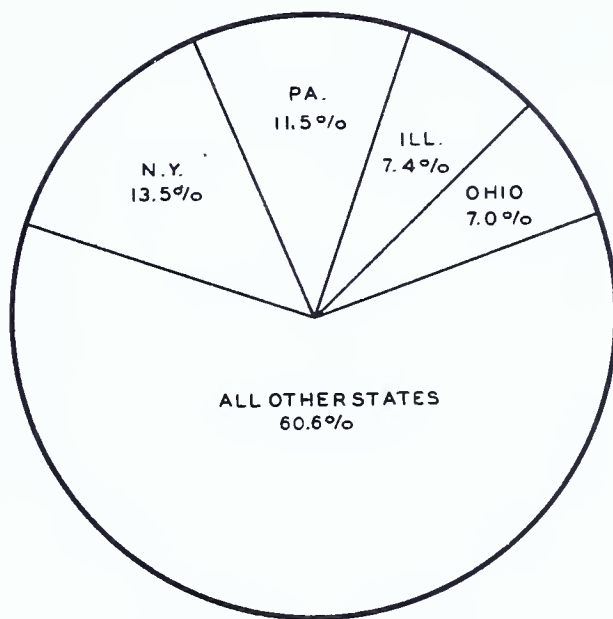
Installed Capacity and Current Generated in Electrical Industry,
Manufacturing Industry and Isolated Plants - 1927. (Census
of Electrical Industries)*

State	Rated Capacity (kw)	Per cent U. S.	Current Generated (kw. hrs.)	Per cent U. S.
New York	4,966,609	13.7	13,852,904,969	13.5
Pennsylvania	3,958,822	10.9	11,870,182,911	11.5
Illinois	2,613,631	7.2	7,596,283,632	7.4
Ohio	2,579,717	7.1	7,244,404,198	7.0
United States	36,275,001	100.0	102,759,753,811	100.0

*On the basis of the United States Geological Survey figures for 1933 for central station capacity and figures for manufacturing and isolated plants as given in the 1927 Census of Electrical Industries, a 1933 Rated Capacity (kilowatts) of approximately 4,175,000 is estimated.

POWER GENERATED IN INDUSTRY

1927

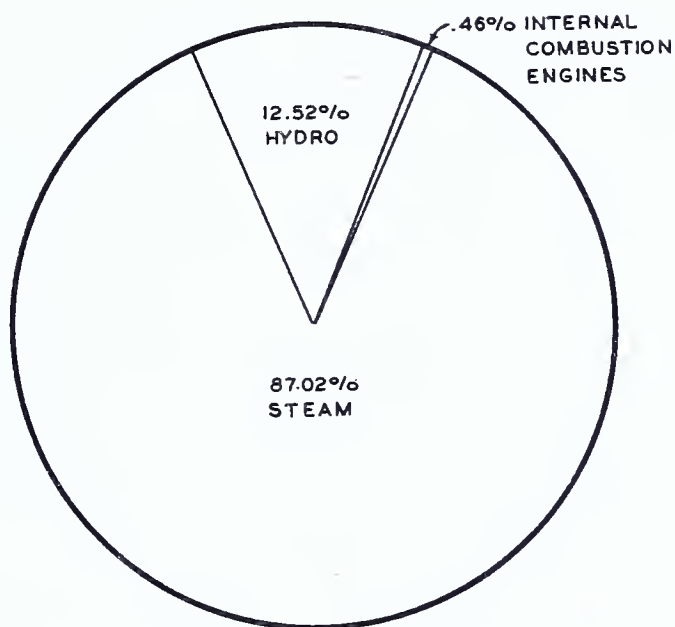


POWER GENERATED IN ELECTRICAL INDUSTRY,
MANUFACTURING INDUSTRY, AND ISOLATED PLANTS.
DIVIDED TO SHOW PERCENTAGES GENERATED
IN FOUR OF THE LEADING INDUSTRIAL STATES



GENERATOR CAPACITY OF UTILITIES

1932



RATED GENERATOR CAPACITY OF CENTRAL
STATIONS DIVIDED TO SHOW PERCENTAGES
BY TYPE OF PRIME MOVER.

Four of the leading industrial states have approximately 40 per cent of the total rated capacity, or have enough generators installed to produce 40 per cent of all the power generated in the United States. Twenty-five per cent of the total power generated in the Nation was in New York and Pennsylvania, 13.5 per cent in New York and 11.5 per cent in this State.

Of the 12,000,000,000 kilowatt hours generated within the State 7,500,000,000,* or approximately 63 per cent was generated by central stations owned by public utility companies or municipalities, and the remainder, or approximately 37 per cent was generated within the plant where it was consumed. Therefore, the present study of electric power resources naturally centers around central station installations.

The rated generator capacity of public utility and municipal plants together for 1932 is given in the following table from Census of Electrical Industries:

Kind of Prime Mover	K. W. Generator Capacity	Per Cent
Steam	2,289,828	87.02
Hydro	329,779	12.52
Internal Combustion	11,645	.46
Total	2,631,252	100.00

* 7,501,974,521 in 1927; 6,373,552,248 in 1932.

The United States Geological Survey as of December 31, 1933, gives the following:

Kind of Prime Mover	K. W. Generator Capacity	Per Cent
Steam	2,371,585	86.59
Hydro	356,405	13.02
Internal Combustion	10,801	.39
Total	2,738,791	100.00

Eighty-seven per cent of the generating capacity was driven by steam, with coal used as fuel, $12\frac{1}{2}$ per cent by water and the remaining one-half of one per cent by internal combustion engines using oil or gas as a fuel.

HYDRO PLANT LOCATIONS.*

On January 1, 1934, there were 62 hydro plants of 100 horsepower or more with a head ranging from six feet to 500 feet. Of these only 41 were operating. A plan accompanies this report showing the location and relative size of these plants.** Five of these plants have approximately 95 per cent of the total installed horsepower. The Safe Harbor plant on the Susquehanna River is the largest, having an installed capacity of 212,500 horsepower and a head of 53 feet. Just below this plant is the Holtwood plant, next in size, with an installed capacity of 158,000 horsepower and a head of 48 to 63 feet. The Hawley plant, located on Wallenpaupack Creek in Wayne

*Information from Pennsylvania Department of Forests and Waters.

**Figure No. 55, page 192.

County, has an installed capacity of 57,000 horsepower with a head of 330 feet. The Piney plant on the Clarion River, in the western part of the State, has an installed capacity of 34,000 horsepower and a head of 75 feet. The York Haven plant on the Susquehanna, above Safe Harbor, has an installed capacity of 29,213 horsepower with a head of 22 feet. Most of the hydro development has been in the eastern part of the State, principally along the Susquehanna, the only important development in the western part being Piney Dam along the Clarion River. The total installed capacity of all the developed hydro sites in the State is 520,000 horsepower.

The potential water power sites with their proposed installed capacities and possibilities are given as follows:*

Delaware River

Studies which are based on the entire existing flow except for the diversion of 440,000,000 gallons daily, the future diversion of which is part of the water supply system of New York City, indicate a large number of water-power sites on the Delaware and its tributaries. Proposed projects envisaging an aggregate installation of 326,000 kilowatts and designed for a 25 per cent load factor, would develop 608,000,000 kilowatt-hours of primary power annually and 540,000,000 kilowatt-hours of secondary power in the year of average run-off. The estimated construction cost is \$46,750,000, or \$143 per installed

*Development of the Rivers of U. S., June 4, 1934. House of Representatives Document No. 395.

kilowatt of production capacity. The power thus generated could be distributed to load centers in New York City, north-eastern New Jersey, the Lehigh Valley and the upper Susquehanna Valley. This area is now dependent on steam power, and in 1930 consumed nearly seven billion kilowatt hours. As the market grows, the addition of a substantial amount of hydro-power which can be used to carry peak loads would be very valuable. In addition, the tributaries of this river afford four sites, two on the Lehigh River and two on the Shohola Creek, which developed to a capacity of 30,000 kilowatts worth about \$8,400,000.

Susquehanna River*

Recent studies by the War Department indicate that there are 47 potential sites for the development of power and storage of water. Twenty of these sites are considered for storage only. The remaining 27 have an ultimate aggregate installation of 2,567,070 kilowatts. The total estimated cost of construction for all sites is \$459,260,000. Power generated in the Susquehanna Valley has a very favorable industrial market, but to quote the report from which this data is taken, "Due to the wide variation between the low-water and high-water flow, the extremely low volume of flow during low-water periods and the scarcity of reservoir sites, the Susquehanna Basin is not well

*Conowingo Dam, on the Lower Susquehanna, is located in Maryland; much of the power generated there, however, is distributed over southeastern Pennsylvania.

adapted to the development of primary base load energy. By utilizing a combination of steam and hydro-electric plants in which the hydro plants furnish peak load power when the river is low and base load power when it is high, certain profitable developments along the river can be found.

The studies indicate that ten sites having an aggregate installed capacity of 2,001,100 kilowatts and estimated to cost \$247,650,000 for their development are worthy of study."

Allegheny River

Potential water-power sites in the Allegheny Valley are confined entirely to its tributaries, the Clarion River having a potential aggregate capacity of 318,000 kilowatts; Brokenstraw and French Creeks, 64,800 kilowatts; Redbank Creek, 19,300 kilowatts; and Mahoning Creek, 49,650 kilowatts. The report states these sites are not particularly attractive under present conditions and their development on a large scale should await more favorable circumstances.

Monongahela River

Recent studies have disclosed many possibilities for hydro-development along this river. Most of these, however, are beyond the state boundaries and undoubtedly have been retarded by the availability of coal resulting in the production of energy at a low cost in steam generating plants. The sites are located favorably in respect to power markets and to large inter-connected transmission systems.

Ohio River

There is one developed site and one potential site along the Ohio River, both of which are down river far beyond the State line.

Beaver River

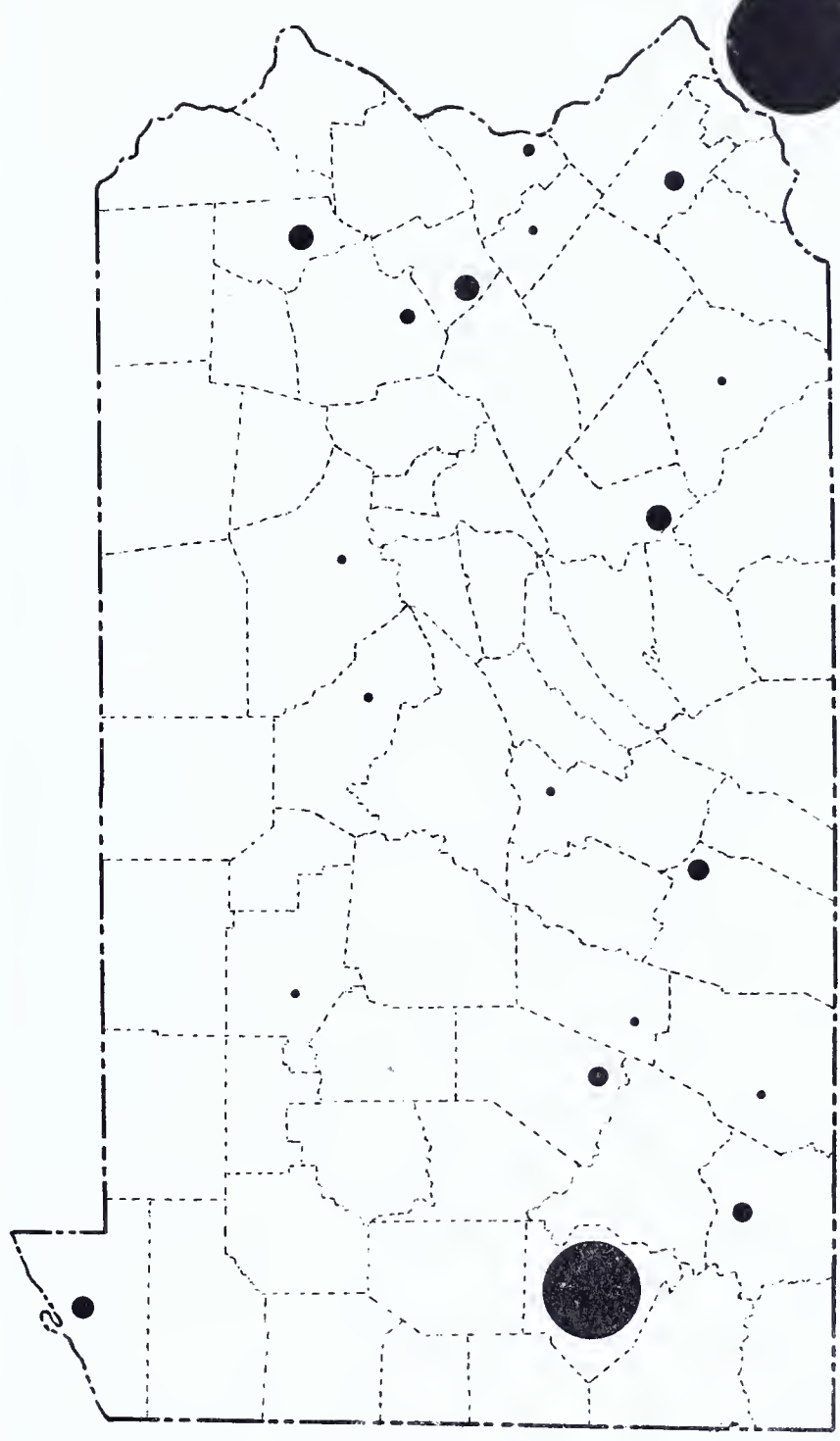
Recent studies have disclosed the water-power possibilities in this valley are along Slippery Rock Creek and Connoquenessing Creek with a potential capacity of 44,850 kilowatts.

There is seemingly large source of water-power in Pennsylvania, but because of the intermittent supply it can never be used as a source of base power, so that coal will continue to be the important factor in our power supply. Many of these proposed sites may be developed with power as a by-product, and in combination with improvements for navigation, flood control or city water supply may be very profitable. The power thus generated could be used in combination with steam-generated power to great advantage.

At the present time, approximately 8 per cent of the power generated within the State is sold in neighboring states, and nearly the same percentage sold in Pennsylvania is generated outside of the Commonwealth. For full development of our power resources in the eastern part of the State we may have to look for markets across the border, while surrounding states, in developing their resources and ferreting out markets may undoubtedly cross into Pennsylvania. These conditions make power development a regional problem rather than a State one.

LOCATION OF STEAM OPERATED CENTRAL STATIONS

SHOWING RELATIVE GENERATING CAPACITY



S P B

FIGURE NO. 107

CENSUS OF ELECTRICAL INDUSTRIES

By referring to the accompanying map,* the location and relative size as to installed capacity of the various steam generating centers can be pictured. Philadelphia and Allegheny Counties are by far the largest producing centers which combined have approximately 40 per cent of the installed steam generating capacity of the State, Philadelphia leading with about one and one-half the installed capacity of Allegheny County. The eastern part of the State, again as in the case of hydro development, has much more generating capacity than the western part. The plants in Allegheny County are examples of mine-mouth stations, being either located right at the mine or within a short haul by rail or water from the source of fuel. The availability of coal, however, was not the only factor in location of these plants. For economic operation an ample supply of water is as essential as the supply of coal.

In Allegheny County and some of the adjoining counties the rivers flow through large deposits of coal. Recent river improvements, which were mainly for flood control and an aid to navigation, have created a more even flow, making this part of the State ideal for steam power development. The Philadelphia plants have been located with an eye to the availability of water, the coal being shipped from the nearest coal fields.

A thorough study should be made of the vast coal resources

*Prepared from a map of transmission lines furnished by the Public Service Commission.

of Pennsylvania -- estimated to be enough at the present rate of consumption to last for 200 years. This may be undertaken by the industry itself, the regulating bodies, the public or a combination of all. It should seek to insure benefits to all, comparable with those being derived elsewhere in the Nation through developments in the industry.

The production of electric power by central stations in Pennsylvania in the five-year period from 1927 to 1932 has decreased from 7,501,974,521 kilowatt hours to 6,373,522,248* kilowatt hours, or a decrease of 15 per cent, while in New York and the country as a whole there was an increase of 10.7 per cent and 6.7 per cent, respectively. The decrease in Pennsylvania may be accounted for by the depressed condition of the steel industry which under normal conditions uses approximately 60 per cent of the power used in all the industries. The load factor, which is a comparison of the generator capacity necessary to produce the 6,373,552,248 kilowatt hours generated with the actual installed generator capacity, was 27.6 per cent for 1932. For 1927, as given by the Bureau of Engineering, Public Service Commission, the load factor was 35.74 per cent. In both these comparisons there was no allowance for stand-by equipment or equipment out of operation for repairs. The distribution of power generated by type of prime mover for 1932 is shown in the following table:

* 6,787,229 in 1933

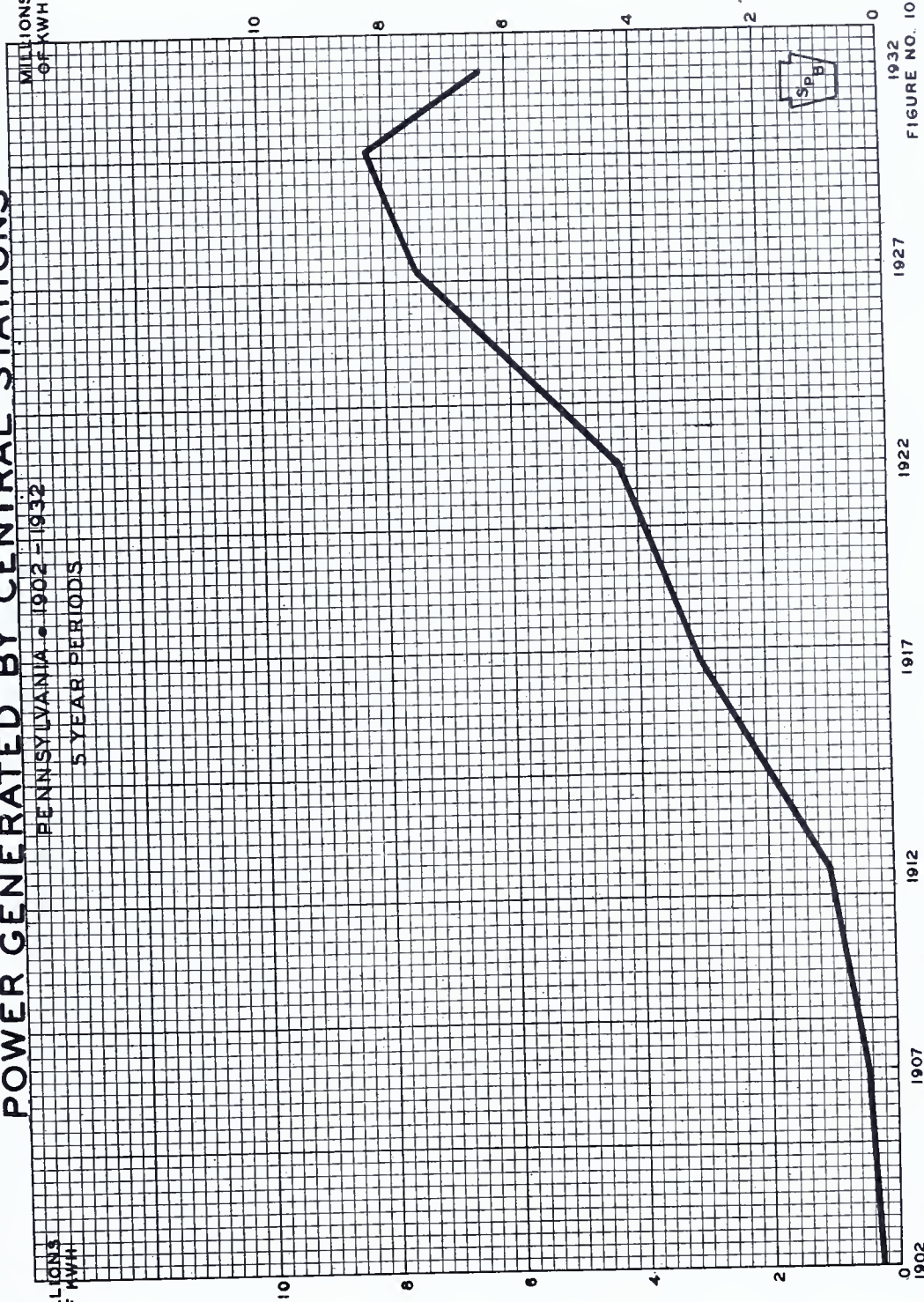
POWER GENERATED BY CENTRAL STATIONS

PENNSYLVANIA • 1902 - 1932

5 YEAR PERIODS

MILLIONS
OF KWH

MILLIONS
OF KWH



CENSUS OF ELECTRICAL INDUSTRIES.

FIGURE NO. 108

(From Census of Electrical Industries, 1932)

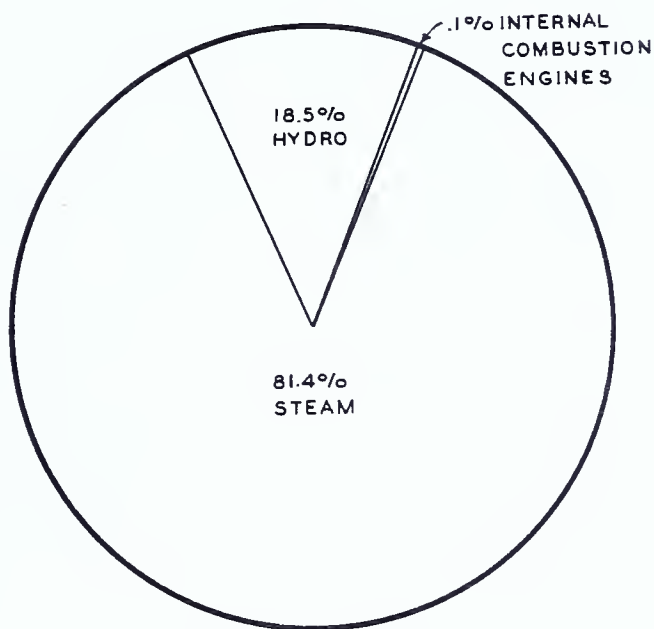
	TOTAL K.W. HRS. GENERATED	STEAM (kw. hrs.)	WATER (kw. hrs.)	INTERNAL COM- BUSTION ENGINE (kw. hrs.)
Pennsyl- vania	6,373,552,248	5,184,145,263	1,181,143,826	8,263,159
Per cent	100.0	81.4	18.5	.12
United States	79,657,466,651	45,374,873,980	33,567,449,749	715,142,922
Per cent	100.0	57.9	42.0	.1

The output per unit capacity for hydro is shown to be greater than for steam. This is explained in a report for 1927 by the Bureau of Engineering, P. S. C., as follows: "The fact that hydro makes a comparatively better showing in this particular than steam, may be due to the fact that much of the reserve equipment is steam operated. Considered alone the energy produced by water power is a large amount, but when it is compared with the tremendous production by coal fired steam, it is seen to be a small factor in the total production."

Of the total 6,373,552,248 kilowatt hours generated, 5,184,145,263 kilowatt hours were generated by steam. In generating this amount of energy 7,955,786,720 pounds of coal were consumed, an average of 1.53 pounds per kilowatt hour. Records of the Bureau of Engineering show the average consumption per kilowatt hour for the years 1922 and 1927 was 2.58 and 1.78, respectively. This marked increase in efficiency involves the saving of approximately 2,500,000 tons of coal in 1932 over 1922 and is largely due to vast developments in boiler room operation and to installation of much larger units, of the turbine type, in new plants taking the place of smaller inefficient steam installations now being discarded. In large plants consumption of coal per kilowatt hour is already under one pound and a still further decrease can be expected within the next ten-year period. There seems to be no need for immediate concern over conservation of coal reserves, because of their vastness. However, it should be noted that the more

POWER GENERATED BY UTILITIES

PENNSYLVANIA • 1932



POWER GENERATED IN CENTRAL STATIONS
OF PENNSYLVANIA DIVIDED TO SHOW PERCENTAGES
BY TYPE OF PRIME MOVER.



accessible veins are being mined first and that the cost of mining will increase as the more inaccessible veins are mined.

TRANSMISSION AND DISTRIBUTION

Transmission and distribution of electrical energy may be understood more clearly if it is pictured as some other transportation facility, for example, air transportation; the network of the airlines being the high voltage transmission lines, the people traveling being the units of energy, the airports being the substations and the bus lines being the distribution systems. The airlines discharge passengers at the airport, the buses distribute them to factory, office or home. Likewise the high voltage transmission lines transmit the energy from the central station to the sub-station, where it is stepped down to lower voltages and then distributed to the ultimate consumer. Just as it is impossible to discharge passengers between airports, it is also impossible to serve small communities from high voltage lines between sub-stations.

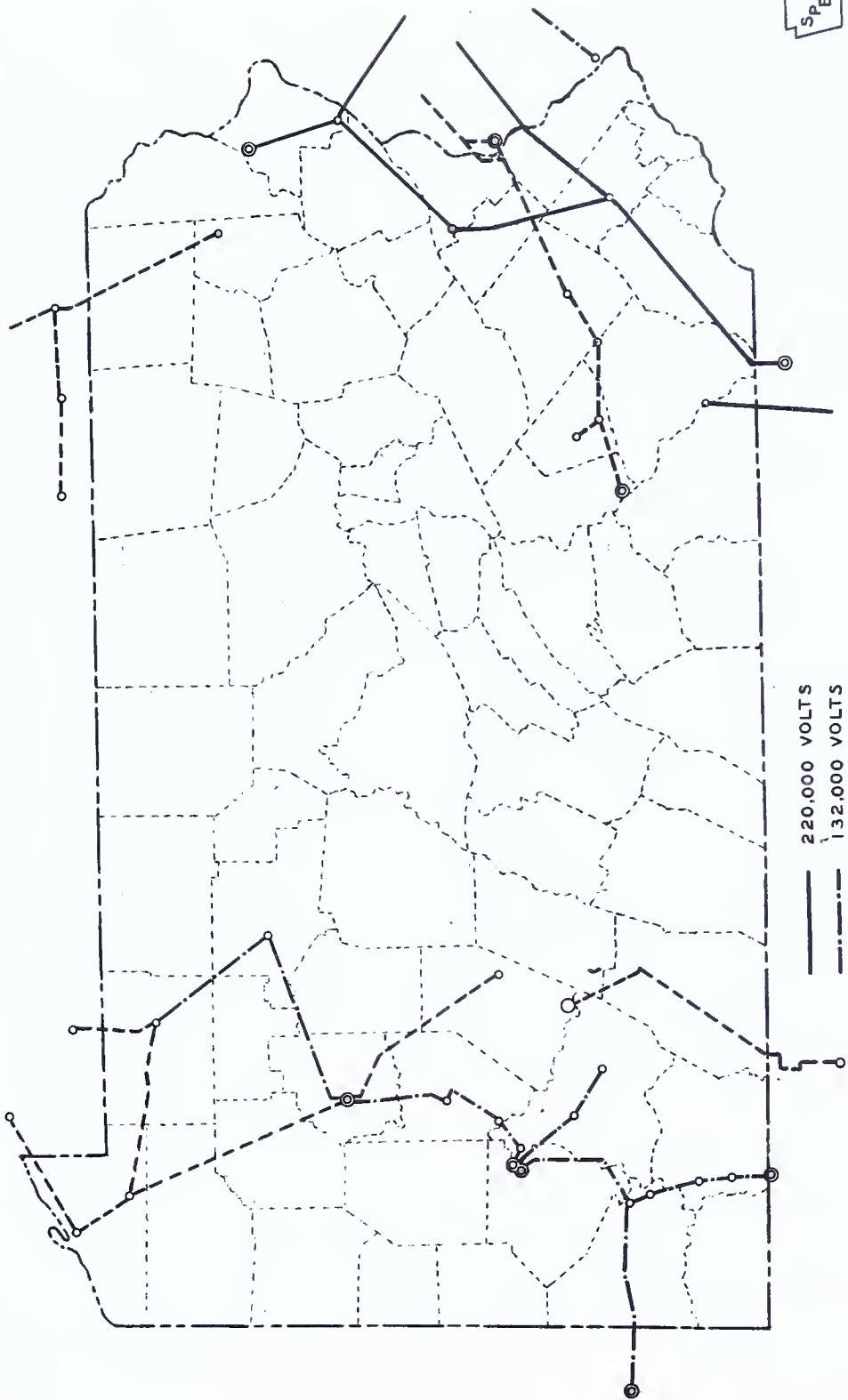
In the 19th century, the days of the steam engine, power was not distributable, and in the early years of the 20th century when electric power was generated as direct current and at low voltages, it could only be distributed within the community where generated. Industry was forced to develop around power and power became one of the big factors in centralization of industry. Streets became congested, slums became crowded and the rural population largely shifted to cities. With the development of alternating current and high-voltage generation

the transmission of electrical energy for long distance became possible. Before 1912 the standard high voltage transmission was 66,000 volts. Then it was increased to 110,000 and 132,000 volts, and now there are transmission lines of 220,000 volts capable of transmitting energy over three hundred miles. This development was a great factor in the progress of the electrical industry. Plants could be located at the source of fuel supply and water, resulting in abandonment of small inefficient stations and construction of large stations which have been interconnected by transmission lines.

The maps* of transmission lines show the network covering Pennsylvania. In the western part of the state, central stations are interconnected by 132,000 volt lines from the Lake Lynn hydro plant on the Cheat River in West Virginia north, across the State, with plants in Pittsburgh, then north with the Piney hydro plant on the Clarion River, north to Erie and then east to New York State. This system also is connected by 132,000 volt lines west of the Windsor Plant in West Virginia. The eastern part of the State is interconnected with 222,000 volt lines from the Conowingo hydro plant, north along the eastern boundary to the Wallenpaupack hydro plant, and then by lesser voltage north into New York State. There are also 220,000 volt lines connecting this system with New Jersey and New York on the east. There are also 110,000 volt lines con-

*Prepared from a map of Transmission Lines furnished by Bureau of Engineering, Public Service Commission.

TRANSMISSION LINES
110,000-132,000 & 220,000 VOLTS



- 220,000 VOLTS
- - - 132,000 VOLTS
- - - 110,000 VOLTS

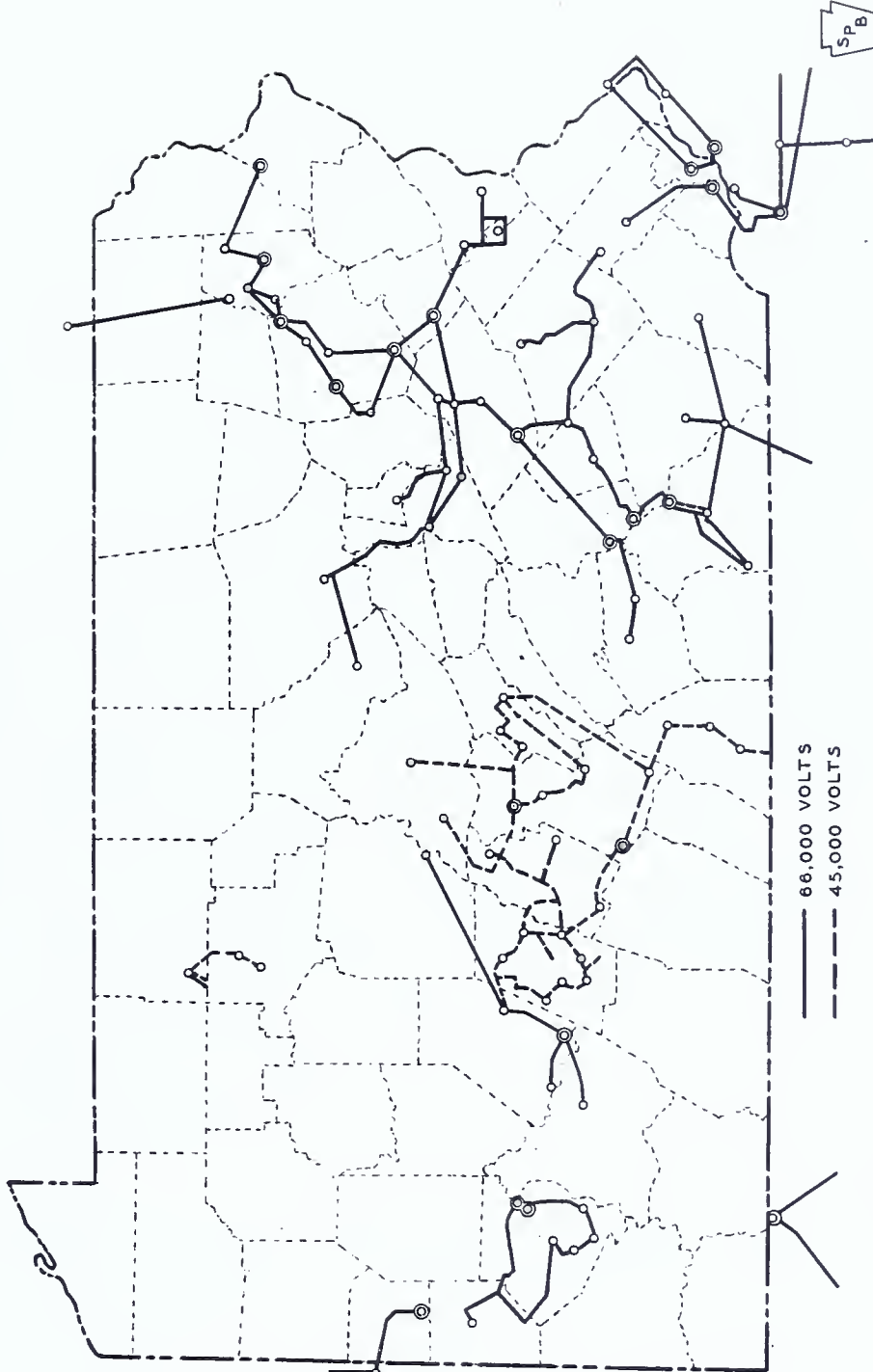
PUBLIC SERVICE COMMISSION



FIGURE NO. 110.

TRANSMISSION LINES

45,000 & 66,000 VOLTS



PUBLIC SERVICE COMMISSION

FIGURE NO. III

necting the eastern and central part of the State. In addition to the lines shown there are lower voltage lines making electrical energy available to parts of every county within the State.

Just as power in the early stages of development was a factor in centralization, it now has become a factor in decentralization. Power is becoming available at most places and at most times, provided the demand is sufficient to extend distribution lines. Rural distribution has not developed in step with the progress made in the industry as a whole. However, data prepared by the Pennsylvania Joint Committee on Rural Electrification* shows considerable progress from 1927 to January 1, 1934. At the beginning of 1927 there were 4,990 miles of rural lines and on January 1, 1934, there were 13,458 miles, an increase of 8,463 miles, or an addition of 4 miles per work day over the seven-year period. It is estimated by the above committee, assuming three farms per mile, that 29,028 miles of new line would be necessary to serve 75 per cent of the farms now without service. At the present rate of construction, this would take 24 years.

*The Pennsylvania Joint Committee on Rural Electrification is a strictly voluntary and cooperative committee, composed of two groups, one made up of representatives of leading farm organizations named by the State Council of Agricultural Associations, and the other of representatives of the Electric Light and Power Companies of Pennsylvania, named by the Pennsylvania Electric Association.

OWNERSHIP

The tendency of utility ownership has been toward incorporation. In 1927, from Public Service Commission Report, 97.71 per cent of the generating capacity of all privately owned plants was reported by holding companies, 1.63 per cent by independent groups and .66 per cent by manufacturing, mining and other interests. There were 41 municipal plants, 14 of which purchased all the power distributed by them from the utilities and 7 purchased part of their power from utilities. With this report there is a map showing the territories served by the various companies. It shows an overlapping of territories, sometimes parts of one territory being isolated by another. This necessitates one company crossing territories of the other with transmission lines. For this purpose strip charters are granted just wide enough for transmission purposes for through lines. The result has been duplication of transmission lines which for the State as a whole has increased the costs of transmission.

CONSUMPTION

The extent to which industry has become electrified can be seen by the comparison of data given in the Census of Manufactures for 1914 with that given for 1929. In 1914, 43.5 per cent of the aggregate installed horsepower in the manufacturing industries was motors driven by electricity. By 1929 the horsepower of motors driven by electricity had increased to 83.5 per cent of the aggregate installed horsepower.

PUBLIC UTILITIES TERRITORIAL MAP

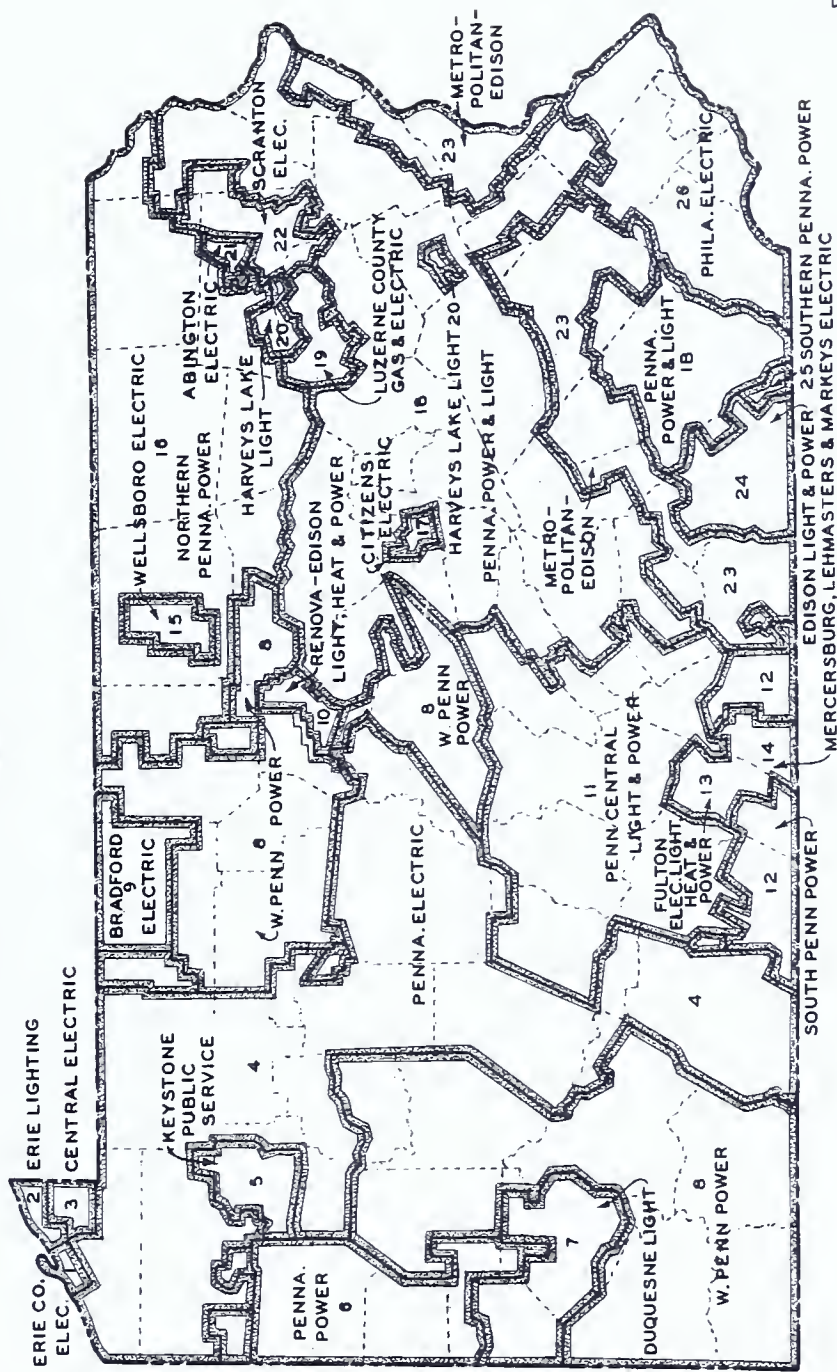
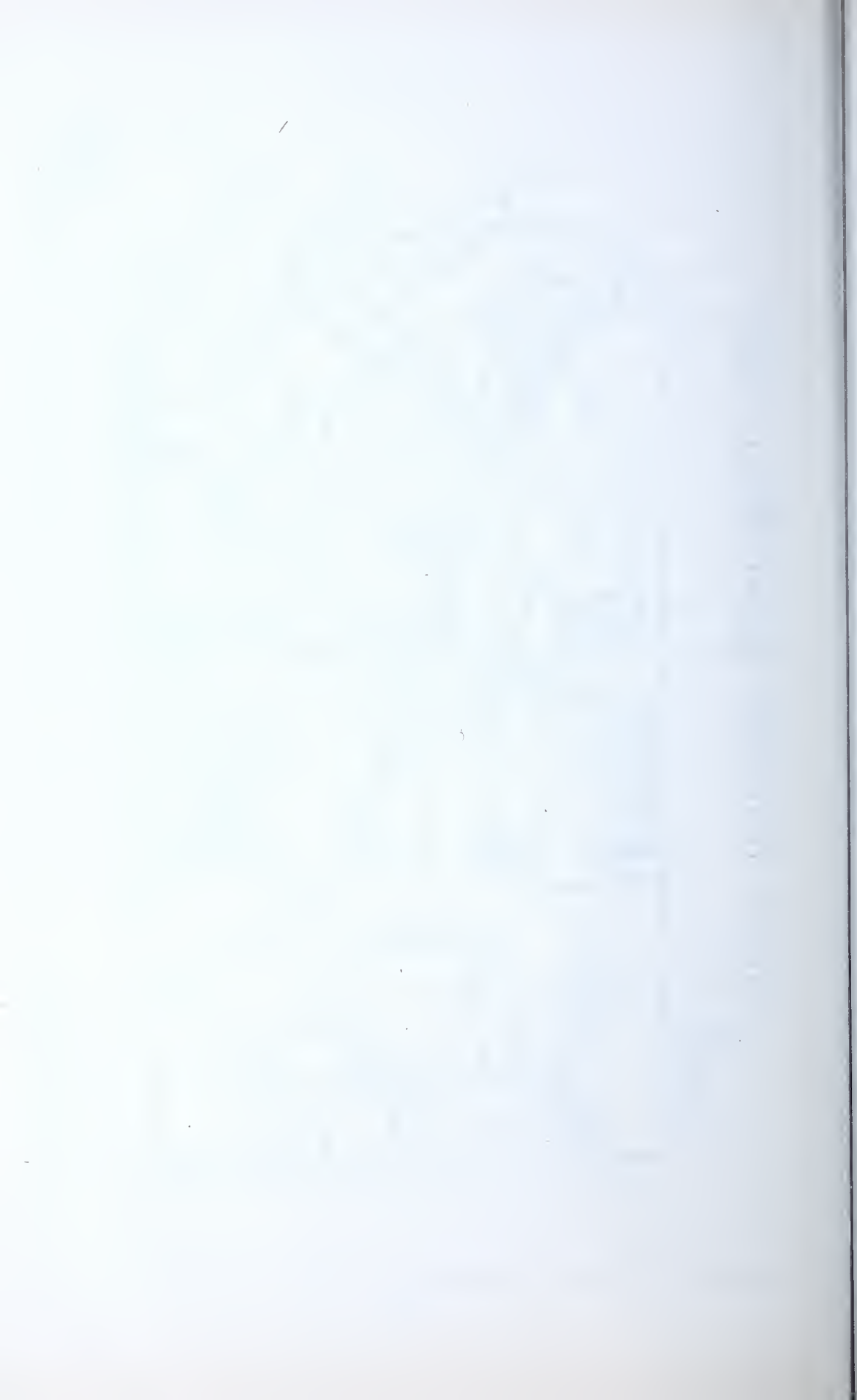


FIGURE NO. 112



The combined horsepower of steam engines and turbines in this period has not varied materially, whereas the power of electric motors has increased rapidly. The increase in aggregate horsepower of all installations was 2,455,668 horsepower, while the increase in power of electric motors driven by purchased energy was 2,301,192 horsepower. Therefore almost all of the increase in installed power was accounted for by the increase in electric motors driven by purchased energy. While 83.5 per cent of the total installed horsepower was electric motors, only 29.5 per cent of them were driven by energy generated within the plant and 44 per cent by purchased energy.

Practically the same indication of electrification exists in the mining industry. In 1929, 86 per cent of the aggregate installed horsepower was motors driven by electricity, only 26.5 per cent of the aggregate being driven by energy generated within the plant and 59 per cent of the aggregate being driven by purchased energy. Installed horsepower is by no means a measure of energy consumption, since the difference between the horsepower rating of electric motors and the actual amount of motor horsepower in daily use varies. This condition is due to the fact that in many factories some of the motors are idle, or are operating at considerably less than their rated capacity during a large part of the time, so that the combined rated capacity of all the motors greatly exceeds the amount of power delivered by them at any given moment. It furnishes, however, an excellent means of arriving at the extent to which industry

has become electrified.

The following table shows the growth of the electrical industry from 1914 to 1930:

NUMBER OF CUSTOMERS, KILOWATTS SOLD AND AVERAGE KILOWATTS PER CUSTOMER*

Type of Consumer	No. Customers		Kwh Sold		Kwh per Customer	
	1930	1914	1930	1914	1930	1914
Power	53,993	15,620	7,597,551,000	812,893,000	104,800	52,000
Commercial	263,869	66,356	665,342,252	122,677,000	2,321	1,848
Residential	1,663,550	158,345	913,503,000	37,249,000	549	235
Total	1,981,412	240,321	9,176,396,252	972,819,000	4,626	4,050

*Taken from Report of Special Committee, Bureau of Engineering, Public Service Commission. Figures are not available to separate the total number of customers and total kwh. sold in 1914 as between residential and commercial classes. However, separation is possible to an extent representing over 70 per cent of the total residential and commercial customers in that year.

SALES TO ULTIMATE CONSUMER--1932
From Census of Electrical Industries

Type of Service	No. of Customers	Kwh. Sold	Average kwh sold per Customer
Total	2,043,251	6,648,677,826	3,254
Industrial	38,636	3,894,890,752	100,810
Commercial	268,980	699,068,453	2,599
Domestic	1,692,175	997,849,180	590
Farm	37,540	28,684,067	764
Municipal (Street Light)	4,505	197,393,606	43,817

The number of power customers increased 246 per cent, the number of commercial customers increased 298 per cent and the number of residential customers increased 954 per cent.

During the same period kilowatt hours sold to power consumers increased 835 per cent, with an average yearly consumption increasing from 52,000 kilowatt hours to 104,800 kilowatt hours, or an increase in average yearly consumption of approximately 100 per cent. For the commercial customers, comprised largely of mercantile establishments, offices, small factories, repair shops and various minor industrial establishments, the increase in kilowatt hours consumed for the same period was 440 per cent, with an average yearly consumption increasing from 1848 kilowatt hours to 2521 kilowatt hours, or an increase of average consumption of 36.4 per cent.

Residential or domestic consumers used twenty-four and one-half times as much power in 1930 as they did in 1914. The average yearly consumption per domestic consumer increased from 235 kilowatt hours to 549 kilowatt hours, or an increase of 134 per cent.

A striking factor is the remarkable increase in the number of domestic consumers and the increase in the use per consumer. This is still more significant when it is considered that in 1932 at almost the lowest period of the depression the number of customers and the consumption per domestic consumer increased.

Comparable data for industrial consumption is not available. One accompanying table gives total sales, while another gives sales to ultimate consumer. In the former industrial power sales from one utility to another for resale are included. However, a marked decrease in generation of kilowatt hours is shown from 1930 to 1932. Consumption of electrical energy depends on two factors, industrial consumption, which is very volatile, and domestic consumption, which is rather stable. This fact has come to be realized by the industry itself and is being used as a factor in building a stable load by appliance promotional campaigns. It is probable that the domestic consumption will double within the next ten years. The trend now is toward universal electric refrigeration in the home and the introduction of air conditioning, electric ranges, electrically operated heating systems and water heaters, which consume current at a low rate continuously or during predetermined periods. It is estimated that 80 per cent of the non-farm population are domestic consumers of electricity supplied by the utilities. The per capita use of electricity increased eight times from 1914 to 1930. If there is a resumption of the rising trend in real incomes existing prior to the depression and a lowering of rates to the extent that they will become attractive to a larger percentage of the population, the per capita consumption probably will increase 50 per cent by 1945.

RURAL ELECTRIFICATION

Progress of rural electrification has been much slower. It is estimated that only 20 per cent of the farm population of the State used electricity supplied by utilities in 1933. The 1930 Census figures show that of 172,419 farms in the State, 45,638, or 26.4 per cent reported dwellings lighted by electricity. Of this number 35,215 purchased electricity, the balance having their own lighting plants.

The number of rural customers receiving central station electrical service in Pennsylvania is shown in an accompanying table, compiled by the Pennsylvania Joint Committee on Rural Electrification from the Pennsylvania Triennial Census of 1927, the Federal Census of 1930, and annual reports of the electric companies.

NO. OF RURAL CUSTOMERS RECEIVING CENTRAL STATION ELECTRIC SERVICE IN PENNSYLVANIA

Year	1927	1928	1929	1930	1931	1932	1933
Farm							
Customers	24,160	28,967	33,215	37,352	40,850	42,770	44,117
Non-Farm	68,343	83,384	96,432	107,575	116,877	122,345	127,688
Total							
Rural	92,503	112,351	129,647	144,927	157,727	165,115	171,805

FARM DWELLINGS LIGHTED BY ELECTRICITY

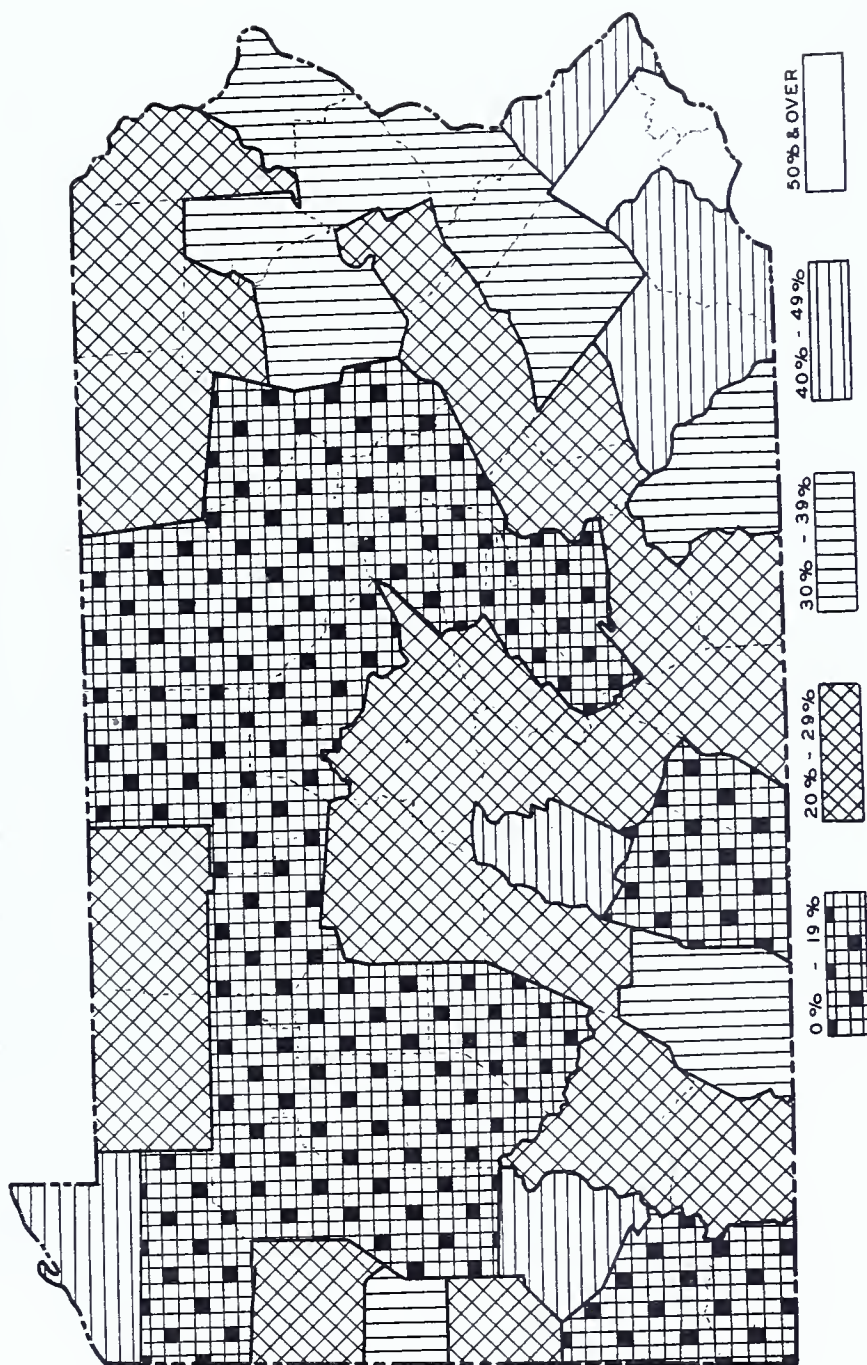


FIGURE NO. 113

Data compiled by a Rural Service Committee of the Pennsylvania Electric Association shows an increase in the average annual consumption per farm from 466 kilowatt hours in 1928 to 922 kilowatt hours in 1931, or an increase of 98 per cent, and a decrease to 910 kilowatt hours in 1932. The slight decrease in 1932 is due probably to the lack of income resulting from the diminishing market for farm products. With the large and varied use, such as water heating, cooking, washing, ironing, refrigeration, etc., for the house and milk cooling, sterilizing dairy utensils, soil heating, utility motors, poultry brooders and water pumping for the farm, it may be estimated that the future average annual consumption per farm may reach 2,000 to 2,500 kilowatt hours.

From a study made in 1932 of 3,000 miles of line, the Joint Committee estimated that in addition to the number of rural customers, there are 20 per cent with service available who are not customers. With this assumption, they estimated 34,361 premises as being potential customers with service available. Farm customers constitute approximately one-fourth of the rural customers and on this basis there would be 8,590 farms and 25,771 non-farms as potential customers with service available. Of the 172,419 farms in the State, 52,707 now have service or have service available, leaving 119,712 farms, or approximately 70 per cent of the farms of the State, without electric service. It is assumed by the Joint Committee that there would be one non-farm customer for each farm, making a

total of 239,424 potential customers without service and that it would be in the public interest to promulgate plans to make service available to 75 per cent or 87,084 farms and 87,084 non-farms. This would necessitate, assuming three farm customers per mile of line and that the non-farms would be served with the farms, the building of 29,028 miles of line.

Cost of rural electrification has been reduced by lengthening spans, so that the average cost now ranges from \$1500 to \$2000. However, these costs are still very high and should be substantially reduced, say to \$900 to \$1000 per mile including transformers and service.

How a reduction in cost from \$2000 per mile to \$1000 would affect the consumer is illustrated in the following example, on the basis of three farmers to the mile and a monthly service charge of 2 per cent of the cost of the line. With the \$2000 cost each farmer would have to pay \$13.33 a month and with the \$1000 cost, \$6.67. This cost is in addition to each farmer's bill for power used. At a $1\frac{1}{2}$ per cent service rate (The Philadelphia Electric Company's rate) these figures would be \$10 and \$5, respectively, per farmer.

Obviously, unless the cost to rural customers is very much reduced, it is not reasonable to expect a rapid expansion in the numbers of this class of customer. Even with the decrease in construction cost, the minimum guarantee of 2 per cent per month charged by most companies is too high to encourage the farmer in the more thinly populated areas to electrify.

The educational programs of farm uses of electricity by State College and the industry itself are not enough. A thorough study of the rural problem should be made with the view of formulating a well planned and coordinated system of developing distribution systems in the rural areas where such a plan would be economically sound. Such a study would be necessary because there has been no data compiled with the idea of a definite plan in mind. With the present attitude toward government aid for the farmer, a self-liquidating distribution plan aided by the government to insure a low minimum charge is feasible, and would remove the barrier which is now delaying rural electrification.

COST OF ELECTRIC POWER

Cost of electric service for the various classes of consumers in recent years has been a topic of much discussion. It may be of interest to note the amount of current consumed by the different types of service and the revenue derived from each class.

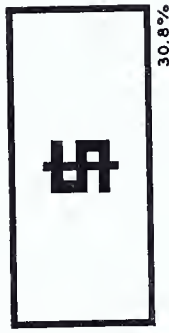
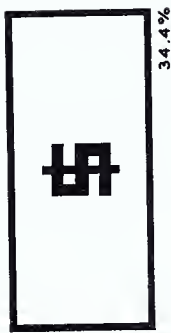
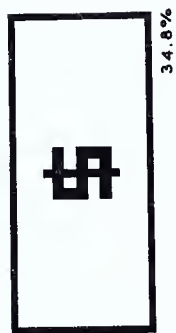
CONSUMPTION OF ELECTRICAL ENERGY BY ULTIMATE CONSUMER
AND REVENUE DERIVED FROM EACH CLASS OF SERVICE. CENSUS
OF ELECTRICAL INDUSTRIES 1932

Type of Service	Kwh Sold	Revenue	% Kwh Sold	% Revenue
Industrial	3,894,890,752	\$59,350,333	58.60	34.8
Domestic	997,849,180	58,724,304	15.03	34.4
Commercial	699,068,453	34,493,217	10.52	20.2
Farm	28,684,067	1,754,055	.41	1.1
Municipal	197,393,606	8,611,219	2.93	5.0
Other Service	830,791,768	7,577,925	12.51	4.5
Total	6,648,677,826	\$170,511,055	100.00	100.00

Domestic consumers bought only 15 per cent of the total power sold and paid 34 per cent of the total revenue while industry bought 59 per cent of the total power sold and paid only 35 per cent of the revenue, or little more than the domestic consumer. The average cost per kilowatt hour to the industrial user was 1.5 cents, while the average cost to the domestic consumer was 5.9 cents per kilowatt hour. The cost of generating a kilowatt hour of energy is the same regardless of its ultimate consumption, the difference of cost being in transmission and distribution. It is generally agreed that the cost of generating and transmission of energy on the basis of an average annual consumption of 600 kilowatt hours per customer ranges between 1 and $1\frac{1}{2}$ cents per kilowatt hour.

The findings of the Power Authority of New York State

ENERGY CONSUMED



WHO PAYS THE ELECTRIC BILL

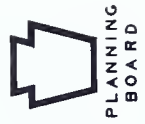


FIGURE NO. 114

PLANNING
BOARD

after three years of research, submitted to the President November 10, 1934, disclose that the cost of distribution only of electrical energy, averaged $2\frac{1}{2}$ cents per kilowatt hour for the users of 50 kilowatt hours per month, approximately the average household use. The report emphasized that the costs upon which these conclusions rest are for private operation of electric system, including a 6 per cent return on all useful fixed capital, and an additional 5.5 per cent to cover depreciation, taxes and insurance. The survey was extended to include the determination of reasonable distribution costs in 29 representative municipalities in New York, Pennsylvania, Indiana, Virginia, California and Washington. For 26 of these cities the analysis was based on engineering field studies. Costs of generation and transmission given here are large enough to allow for the difference between the 6 per cent return included in the New York report and the 7 per cent return allowed by the Pennsylvania Public Service Commission.* It would then seem that the average return per kilowatt hour for domestic consumption should be between $3\frac{1}{2}$ and 4 cents instead of the 5.9 cents given by the 1932 Census of Electrical Industries. A drop from 5.9 cents to 3.5 or 4 cents would mean a saving to domestic customers of \$11 to \$14 annually.

*The Pennsylvania Public Service Commission has asked the companies to go on a 6 per cent basis.

CONCLUSIONS

Domestic consumers are paying a disproportionate share of the electrical power bill in Pennsylvania. There is need of a comprehensive study of power distribution and the cost to consumers in the State. Such a survey should be similar to that recently completed by the Power Authority of the State of New York. Any such study should be made with a view to the possibility of lowering the cost of power to the domestic consumer and an extension of rural electrification. It also should include development of the State's coal resources as a source of base power, as well as development of water power sites. The possibility of coordinating both sources and their interconnection with present supplies also should be considered.

Any sound State plan for the development of Pennsylvania's power resources to meet the needs of consumers should fit in with long range regional plans.

STATE GOVERNMENT

The organization of State Government has been touched upon in various parts as incidental to its functions. To have considered organization in detail would have been merely to duplicate the thorough and comprehensive report, "A Survey of the Government of Pennsylvania," just issued by the Joint Legislative Committee on Finances. (The Sterling Committee Report)

Since publication of the Sterling report, however, developments at Washington have indicated the value of the Federal Government's Central Statistical Board. The Sterling Committee recommended that a State Statistical Board be established to attempt to bring about general unity in statistical efforts. It is suggested the American Statistical Association be invited to cooperate in Pennsylvania in making a study and in setting up machinery as it did in Washington.

Functions of local government taken over by the State governments elsewhere in the United States may well receive further consideration to see if anything has been developed which might be applied usefully in Pennsylvania.

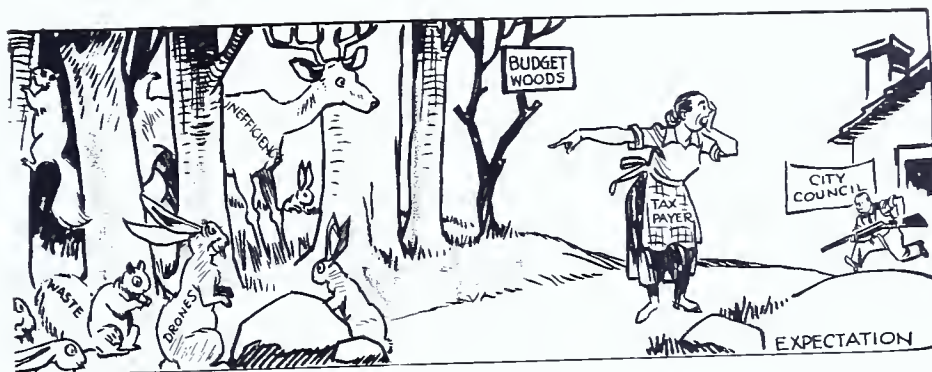
LOCAL UNITS OF LOCAL GOVERNMENT*

BEGINNINGS OF LOCAL GOVERNMENT

The Commonwealth of Pennsylvania began subdividing itself soon after the first colonists arrived in 1623, until it now contains 5,636 separate local taxing units. The township seems to have appeared first. Under the Duke of York's laws, in effect some years before Penn's arrival in 1682, each settlement or town had some degree of self-government. The most numerous and important local officials were peace officers. Each town chose eight overseers who had limited ordinance-making power and authority to levy taxes. The overseers also assessed persons and property, while the duty of collecting taxes devolved upon the constables.

The formation of three counties was one of Penn's first acts. These were Chester, Bucks and Philadelphia. Creation of the first boroughs and cities followed shortly. Upland, now the city of Chester, was the first borough and Philadelphia, chartered in 1701, the first city.

*Prepared by Bradford W. West, Ph.D., Wharton School of Finance and Commerce, University of Pennsylvania, except for the "Accounting Suggestions", which were prepared by Charles J. Rowland, Ph.D., of The Pennsylvania State College. Valuable suggestions were made by members of the staff of the Pennsylvania Economic Council, especially Mr. Robert D. Dripps, and by Blake E. Nicholson, Ph.D., and Edward W. Carter, Ph.D., of the University of Pennsylvania, and Harold F. Alderfer, Ph.D., of The Pennsylvania State College. General conclusions added by State Planning Board.



CITY BUDGET MAKING IN 3 REELS
 COURTESY OF JERRY DOYLE AND PHILADELPHIA RECORD



PRESENT SYSTEM OF LOCAL GOVERNMENT

The organization of the taxing units into a system of local government is comparatively simple. First, because there are only seven kinds of political subdivisions having power to levy taxes. These are the county, city, town, borough, township, school district and poor district. Secondly, cities, towns, boroughs and townships, are mutually exclusive. Cities, boroughs and towns are incorporated. When territory is incorporated it is withdrawn from the township of which it was previously a part. There is no overlapping of these units. No part of the Commonwealth can be subject to the jurisdiction of more than four units of local government. Except in Philadelphia, every part of the Commonwealth is subject to at least three. The primary subdivisions of the Commonwealth are the 67 counties. The counties are further subdivided into 47 cities, one town, 936 boroughs and 1,577 townships, or a total of 2,561 secondary governmental subdivisions. Superimposed upon these are the 2,584 school districts which are usually, but not always, coextensive with the secondary subdivisions. The poor districts constitute the fourth layer.

POLITICAL SUBDIVISIONS

Section 34 of Article III of the Constitution of Pennsylvania provides:

"The legislature shall have the power to classify counties, cities, boroughs, school districts and townships according to population, and all laws passed relating to each class, and all laws passed relating to, and regulating procedure and proceedings in court with reference to any class, shall be deemed general

legislation within the meaning of this Constitution; but counties shall not be divided into more than eight classes, cities into not more than seven classes, school districts into not more than five classes, and boroughs into not more than three classes."

(Amendment of November 6, 1923)

This permits classification on a population basis only.

The legislature has made partial use of this authority.

Counties are classified as follows:

<u>Class</u>	<u>Basis of Classification</u>	<u>Number of Counties</u>
First	1,500,000 or more	1 (Philadelphia)
Second	800,000 to 1,500,000	1 (Allegheny)
Third	250,000 to 800,000	5
Fourth	150,000 to 250,000	11
Fifth	100,000 to 150,000	4
Sixth	50,000 to 100,000	17
Seventh	20,000 to 50,000	17
Eighth	Less than 20,000	11

There are four classes of cities, but no classification of boroughs has been made. The population of boroughs ranged from 17 to 35,853 in 1930. Forty-nine boroughs are large enough to become third-class cities if their inhabitants so desire, but 420 are small villages of less than 1,000.

Townships have been divided into two classes, the first class consisting of those having an average population density of 300 persons per square mile. Because of this basis of classification, some have less than one thousand inhabitants, whereas sixty-two second-class townships have more than 5,000 inhabitants each. A majority of the first class townships have more than 5,000 inhabitants, Upper Darby having 46,626 in 1930.

School districts have been divided into four classes. Those

DISTRIBUTION OF POPULATION

BY TYPE OF CIVIL SUBDIVISIONS
PENNSYLVANIA • 1910-1930

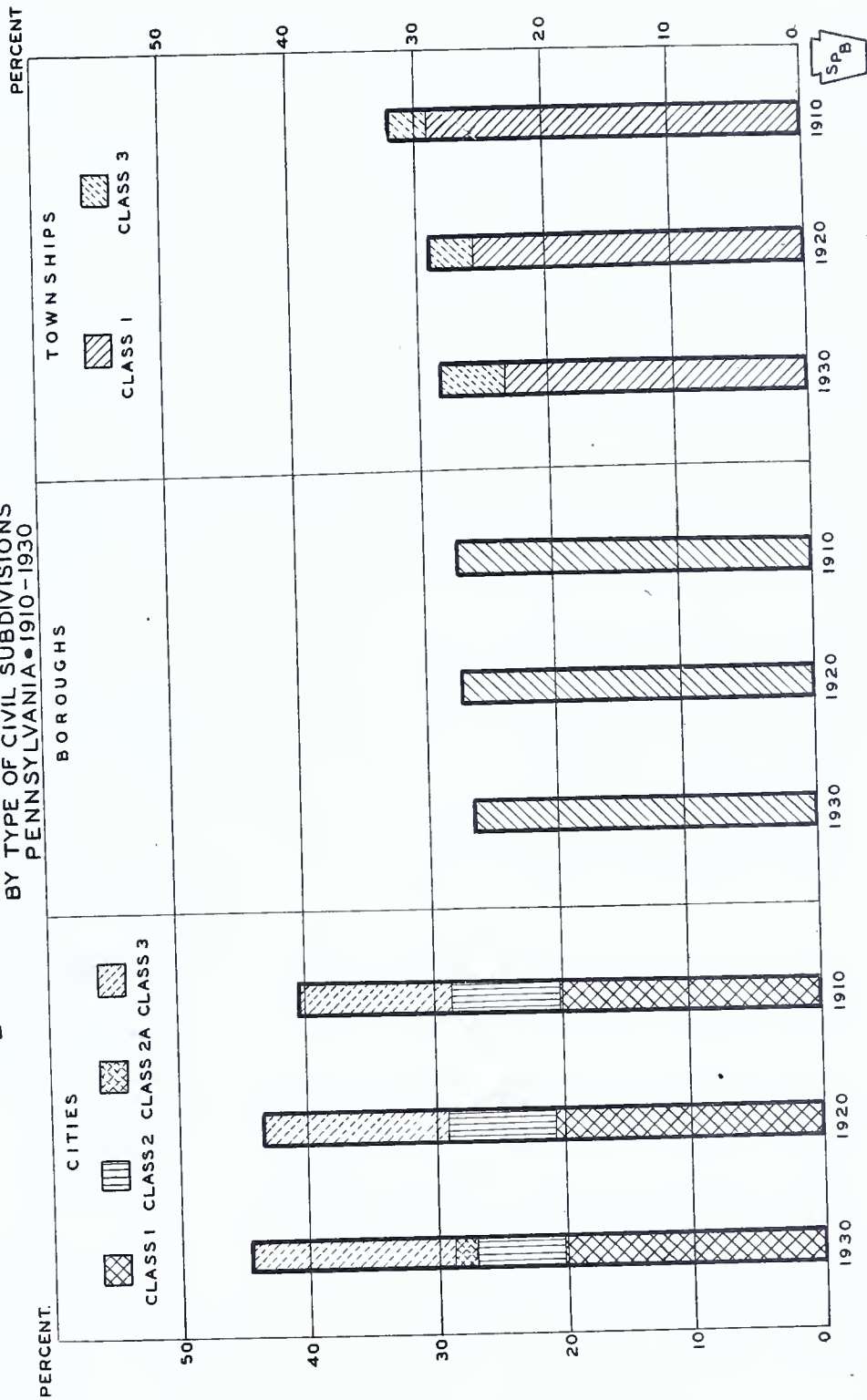


FIGURE NO. 116

having more than 500,000 inhabitants constitute the first class, 30,000 to 500,000 the second class, 5,000 to 30,000 the third class, and less than 5,000 the fourth class. In January, 1934, there were two districts of the first class, 20 second, 257 third, and 2,306 fourth.

There is no legal classification of poor districts. In 50 counties the poor district is coextensive with the county. Most of the other 374 poor districts are coextensive with cities, boroughs, or townships. A few are smaller in area than the municipalities within which they lie while several include two or more municipalities. Two districts extend across county lines.

The distribution of the local governmental units in Pennsylvania, as of July 1, 1934, is shown in an accompanying table.

Distribution of Local Government Units in Pennsylvania
(As of July 1, 1934)

<u>Counties</u>	<u>Cities</u>	<u>Boros</u>	<u>Townships</u>		<u>School Districts</u>	<u>Poor Districts</u>	<u>Total Number of Units</u>
			<u>1st-Class</u>	<u>2nd-Class</u>			
Adams	-	11	-	21	34	1	67
Allegheny	4	65	24	29	121	2	245
Armstrong	-	17	-	28	46	1	92
Beaver	1	26	4	22	53	1	107
Bedford	-	13	-	25	40	1	79
Berks	1	30	-	44	68	1	144
Blair	1	8	-	15	25	1	50
Bradford	-	14	-	38	54	1	107
Bucks	-	23	-	31	55	1	110
Butler	1	22	1	32	57	1	114
Cambria	1	32	1	29	61	1	125
Cameron	-	2	-	5	8	7	22
Carbon	-	12	-	12	26	16	65
Centre	-	11	-	25	35	36	107
Chester	1	15	-	57	74	1	148
Clarion	-	13	-	22	36	1	72
Clearfield	1	19	-	30	49	1	100
Clinton	1	7	-	21	29	1	59
Columbia	-	9*	-	24	32	27	92
Crawford	2	15	-	35	55	1	108
Cumberland	-	12	-	22	34	1	69
Dauphin	1	16	1	22	40	1	81
Delaware	1	25	10	11	46	1	94
Elk	-	3	-	10	13	1	27
Erie	2	16	1	21	40	1	81
Fayette	2	14	-	24	43	1	84
Forest	-	1	-	8	9	1	19
Franklin	-	6	-	15	20	1	42
Fulton	-	1	-	11	12	12	36
Greene	-	7	-	20	27	1	55
Huntingdon	-	18	-	30	48	1	97
Indiana	-	14	-	24	42	1	81
Jefferson	-	11	-	23	35	1	70
Juniata	-	4	-	13	17	17	51
Lackawanna	2	19	1	20	42	21	105
Lancaster	1	18	-	41	62	1	123
Lawrence	1	8	-	17	28	1	55
Lebanon	1	8	2	16	25	1	53
Lehigh	1	8	1	14	25	1	50
Luzerne	4	33	4	32	73	35**	181

Counties	Cities	Boros	Townships		School Districts	Poor Districts	Total Number of Units
			1st-Class	2nd-Class			
Lycoming	1	9	-	42	52	52	156
McKean	1	6	-	15	22	1	45
Mercer	2	14	-	32	48	1	97
Mifflin	-	5	-	10	14	1	30
Monroe	-	4	-	16	20	1	41
Montgomery	-	24	8	30	66	1	129
Montour	1	2	-	9	11	10	32
Northampton	2	19	-	17	39	1	78
Northumberland	1	12	1	23	38	36	111
Perry	-	9	-	21	29	1	60
Philadelphia	1	-	-	-	1	7	9
Pike	-	2	-	11	12	1	26
Potter	-	6	-	25	30	1	62
Schuylkill	1	29	-	37	68	1	136
Snyder	-	5	-	15	20	20	60
Somerset	-	23	-	25	48	1	97
Sullivan	-	4	-	9	13	1	27
Susquehanna	-	13	-	27	41	36	117
Tioga	-	10	-	30	40	1	81
Union	-	4	-	10	15	14	43
Venango	2	7	-	21	30	1	61
Warren	-	7	-	23	30	1	61
Washington	2	32	1	32	70	1	138
Wayne	-	6	-	22	28	27	83
Westmoreland	3	38	-	23	64	1	129
Wyoming	-	5	-	18	24	1	48
York	1	36	1	34	72	1	145

TOTALS	47	937*	61	1,516 *	2,584	424**	5,569
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Counties							<u>67</u>
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GRAND TOTAL							5,636
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* Includes one town

** One District recently subdivided making a total of 36, grand total 425.

Local Subdivisions by Classes, and Percentage of
State Population in Each Class, 1930, 1920, and 1910.

	<u>1930</u>		<u>1920</u>		<u>1910</u>	
	Number of sub- divisions	Per- cent of State Popula- tion	Number of sub- divisions	Per- cent of State Popula- tion	Number of sub- divis- ions	Percent of State Popula- tion
<u>CITIES</u>	45	44.8	38	43.6	29	40.4
Class 1	1	20.3	1	20.9	1	20.2
Class 2	1	7.0	2	8.3	2	8.7
Class 2A	1	1.5	-	-	-	-
Class 3	42	16.0	35	14.4	26	11.5
<u>BOROUGHES</u>	940	26.6	934	27.2	901	27.5
<u>TOWN</u>	1	0.1	1	0.1	1	0.1
<u>TOWNSHIPS</u>	1574	28.5	1565	29.0	1555	32.0
1st-Class	62	4.9	57	3.5	43	3.0
2nd-Class	<u>1512</u>	<u>23.6</u>	<u>1508</u>	<u>25.5</u>	<u>1512</u>	<u>29.0</u>
<u>T O T A L S</u>	2560	100.0	2538	100.0	2486	100.0

Philadelphia County with only nine subdivisions and Allegheny with 245 are the extremes of consolidation and decentralization.

POPULATION TRENDS

The number of cities, boroughs, towns and townships, by classes, in 1910, 1920 and 1930 is shown in an accompanying table. It also shows what proportion of the total population was governed under the laws relating to each type. This is shown also in an accompanying chart. (The population of the single town is included with that of the boroughs in this chart.)

Philadelphia, held its place consistently, with slightly more than one-fifth of the population. Pittsburgh and Scranton likewise maintained their relative importance. The number of third-class cities increased 61.5 per cent, or from 26 in 1910 to 42 in 1930. Whereas only 11.5 per cent of the population resided in third-class cities in 1910, 16 per cent lived there in 1930. In the latter year 44.8 per cent of the total population resided in cities.

This gain for the cities was at the expense of the boroughs. The percentage of the population living in boroughs dropped from 27.5 per cent in 1910 to 26.6 per cent in 1930, although the number of boroughs increased by 39. The creation of 16 new cities would have resulted in a much greater drop in the number of people under the borough form of government had not more than 55 new boroughs been formed from townships or parts of townships. The creation of new boroughs has slowed down materially since 1920. There are four less in 1934 than there were in 1930.

Bloomsburg, the only town in the State grew at about the average rate, maintaining its relative importance. It is possible that this form of government may disappear entirely in the near future. The borough code provides that any town may adopt the borough form of government. Moreover, if Bloomsburg maintains its present rate of growth, it soon will be eligible for a third-class city charter.

There has been a natural increase in the number of first-class townships and in the percentage of population there. These townships are for the most part suburban adjuncts of large cities. Thus 28 are in Allegheny and Beaver counties, 18 in Delaware and Montgomery counties, five in Lackawanna and Luzerne counties, and only ten throughout the remainder of the Commonwealth. The shift of population to suburban areas tends to make this type of government more common but this is partially checked by the tendency to create new incorporated places or to extend the boundaries of those already in existence.

The number of second-class townships remained the same in 1930 as in 1910. They gained 86,000 inhabitants. But due to the continual tendency to incorporate their more populous parts, the portion of the total population living in a second-class townships dropped from 29 per cent in 1910 to 23.6 per cent in 1930.

In twenty years 74 cities, boroughs and townships were created in excess of the number lost by consolidations. Since the creation of one of these subdivisions usually incurs the

formation of a new school district, approximately 150 new separate taxing subdivisions were added to Pennsylvania's local government system. Twenty-eight counties had less than 75 inhabitants per square mile in 1930, 14 from 75 to 150, 16 from 150 to 300, seven from 300 to 600, and two, Philadelphia and Allegheny, more than 600. Cities are in only thirty-one counties, of which only nine had population densities of less than 150 persons per square mile. The first class townships are concentrated in fifteen counties, of which all but two have more than 150 inhabitants per square mile. In 32 counties a majority of the people lived in second-class townships. This group included all but two of the 11 eighth-class counties and all but three of the 17 seventh-class counties. The average number of incorporated places per county in these 32 counties is only 10.1 whereas in the other counties (except Philadelphia), the average is 19.5

MANDATORY AND OPTIONAL FUNCTIONS

Functions delegated by the Commonwealth to any of its subdivisions are optional with the local unit or made mandatory by State law or the State Constitution. If mandatory, the expenditure required also may be fixed by the Commonwealth. In other cases the State law fixes minimum or maximum expenditures or leaves to local authorities a large range of choice as to how elaborately and expensively they will perform the function. Thus the payment of county commissioners and provision for the support of county prisoners are both made mandatory by State

law, but the law fixes the exact amount of the commissioners' salaries, whereas the cost of maintaining prisoners depends upon the number of prisoners and other factors.

The extent to which the expenditures of local subdivisions are controlled by State law rather than by local opinion is of fundamental importance to understanding the problems in planning for local government. Two recent studies have made a valuable beginning in determining the extent to which the cost of local government is fixed by State law. These are "County Government Costs in Pennsylvania" by F. P. Weaver and H. F. Alderfer and "Mandatory Expenditures of Local Government in Pennsylvania" by Edward W. Carter.

COUNTY FUNCTIONS

Most of the important functions performed by the counties, and their expenditures are mandatory in nature or in amount, or both.

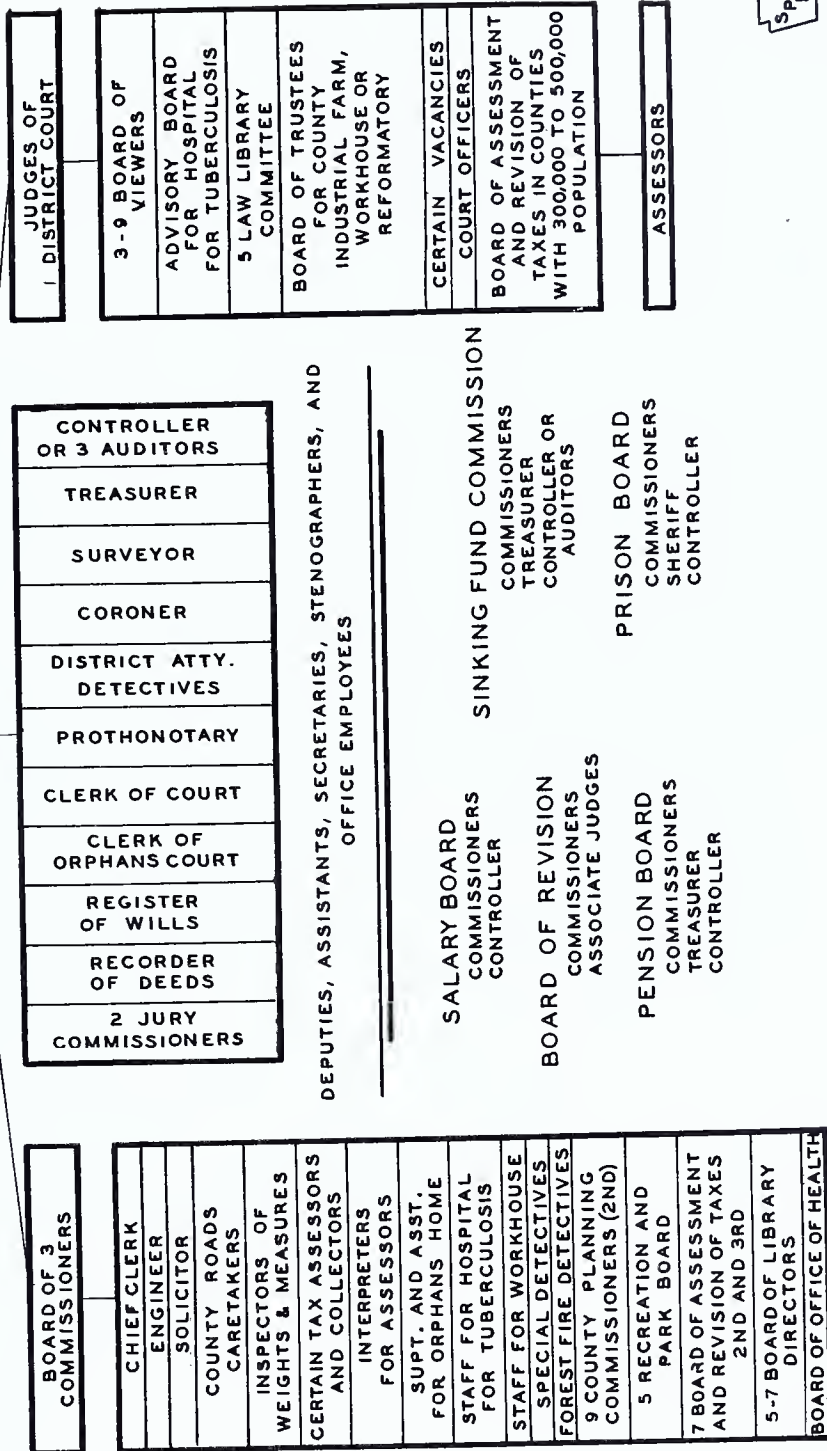
The mandatory expenses include:-

1. The items for administration of justice.
2. The conduct of primaries and elections.
3. Recording deeds and registering wills, births and deaths.
4. Paying for road damages.
5. Maintenance of county highways and bridges.
6. Paying for burial of veterans and their widows and for markers for veterans' graves.
7. Compiling war records, paying the G.A.R. for Memorial Day observance, and providing flags to decorate soldiers' graves.

COUNTY OFFICERS - 2ND TO 8TH CLASS COUNTIES

PENNSYLVANIA

VOTERS



SPB

FIGURE NO. 117

8. Inspecting Weights and Measures.
9. Collecting returned taxes on seated and unseated lands.
10. Paying assessors and costs of registering voters.
11. Paying salaries and certain expenses of the county commissioners and other officials provided for by State law.
12. Paying the office expenses, etc., of the County Superintendent of Schools and for the annual convention of school directors in the county.

Counties may, at their option, engage in a large number of other activities. The more important include aiding in providing recreational facilities, libraries, hospitals, public auditoriums and airports. Counties also may provide canals and waterways and aid in the control and prevention of floods. By appropriations they may aid agricultural societies, various historical and educational associations, veterans and National Guard units. They may provide and maintain memorials, drill gas wells, provide ornamental street lights about the county building, and exercise various other minor powers. Authority for county planning is granted second-class counties.

The organization chart for counties, adapted from a chart prepared by F. P. Weaver and H. F. Alderfer, illustrates the typical organization for governing all counties except Philadelphia. There is no other type of local subdivision in Pennsylvania where authority is as decentralized as in the counties. The county organization is the result of the gradual accretion of new agencies as the powers of the county expand. Fourteen

sets of officials are elected, many specifically provided for in the State Constitution. A large number of other offices are filled by appointment by the county commissioners. Additional appointing power is vested in the judges of the district court. Nearly all elected officers may appoint some subordinates. Except in the seventh and eighth class counties, a county salary board decides the number and compensation of such employees. The ex-officio boards for the revision of taxes, prison board and sinking fund commission complete the usual county organization. Counties of the second class may have a pension board.

FUNCTIONS OF TOWNSHIPS AND BOROUGHES

There is a large degree of similarity between the mandatory functions of townships, boroughs and cities, but there are two differences. First, the optional functions vary and some optional functions for sparsely populated units are mandatory. Second, the governmental organization is more complex for cities.

Townships of both classes have the same mandatory functions. These are:

1. Maintenance of the minimum governmental organization specified in the township code.
2. Collection of township taxes.
3. Maintenance of township highways and bridges.

In addition, the following mandatory functions are performed at county expense by officials elected in each township. Administration of justice by justices of the peace, maintenance of law

and order by constables, and assessment of taxes except in counties of the second and third classes.

Optional functions of second class townships include:

Providing fire protection.

Providing watering troughs.

Providing for garbage and trash removal and prevention of nuisances.

Providing for insurance - workmen's compensation, fire, public liability or group policies for the benefit of township employes.

Erecting and maintaining public buildings.

Providing water and sewer systems.

Providing parks, playgrounds, etc., and appropriating money for forest conservation.

Regulating traffic.

Assisting by appropriations for Memorial Day services, the Armory Board and National Guard units.

Maintaining memorials and providing burial plots for ex-service men.

In addition, the supervisors, on petition of residents of any part of the township, may light specified streets, provide water for fire protection and other uses, and provide sidewalks. Beneficiaries of these special services pay for them. Lockups may be built and fire equipment costing more than a specified amount may be purchased only after the projects are approved at an election. The court of quarter sessions may direct the

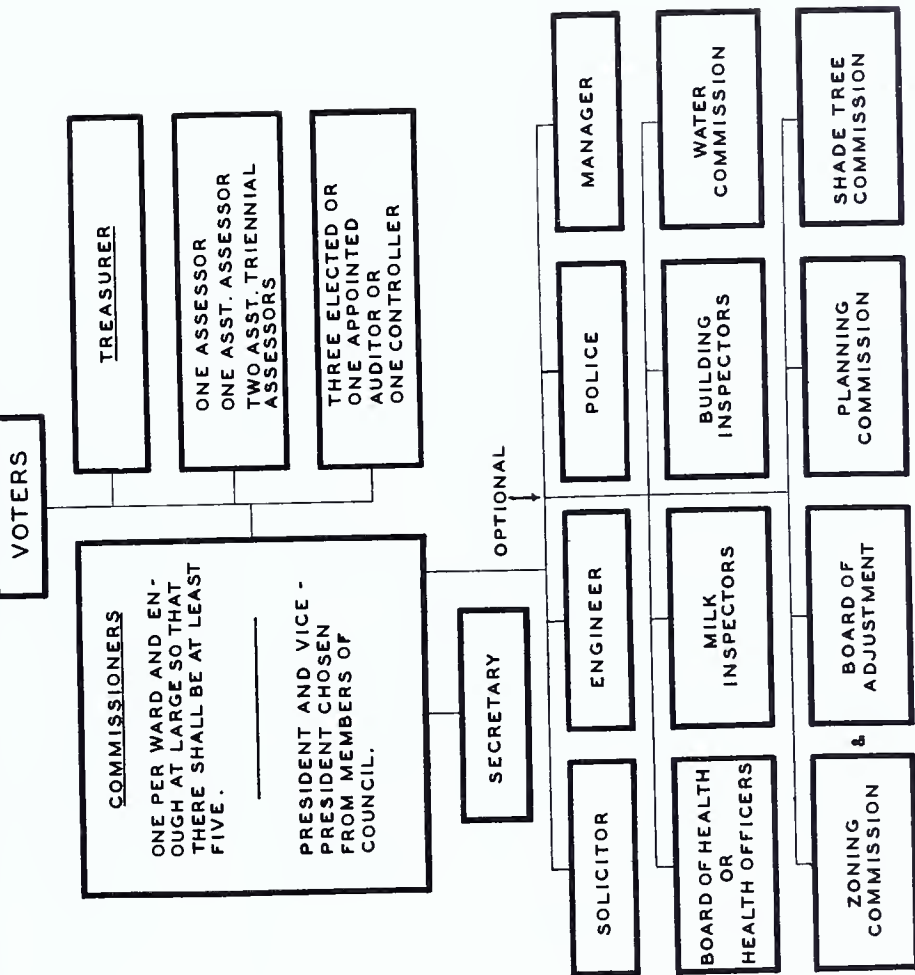
appointment of policemen for any part of the township whose residents petition for such protection.

The governmental set-up for performance of these functions is shown in the accompanying organization chart for townships of the second class. The voters elect three supervisors, an assessor, three auditors and a tax collector. A secretary and treasurer are appointed by the supervisors. The minimum organization required by law is completed when the supervisors appoint a road superintendent if the township is not divided into road districts, or a road master for each district if it is divided. Appointment of township solicitors and engineers is optional with the supervisors who also may appoint unpaid park and recreation boards and a waterworks commission.

First class townships may perform any of the functions of second class townships, but the commissioners may act more frequently than second class township supervisors upon their own initiative. Moreover, first class townships are authorized to perform many additional municipal functions. These include:

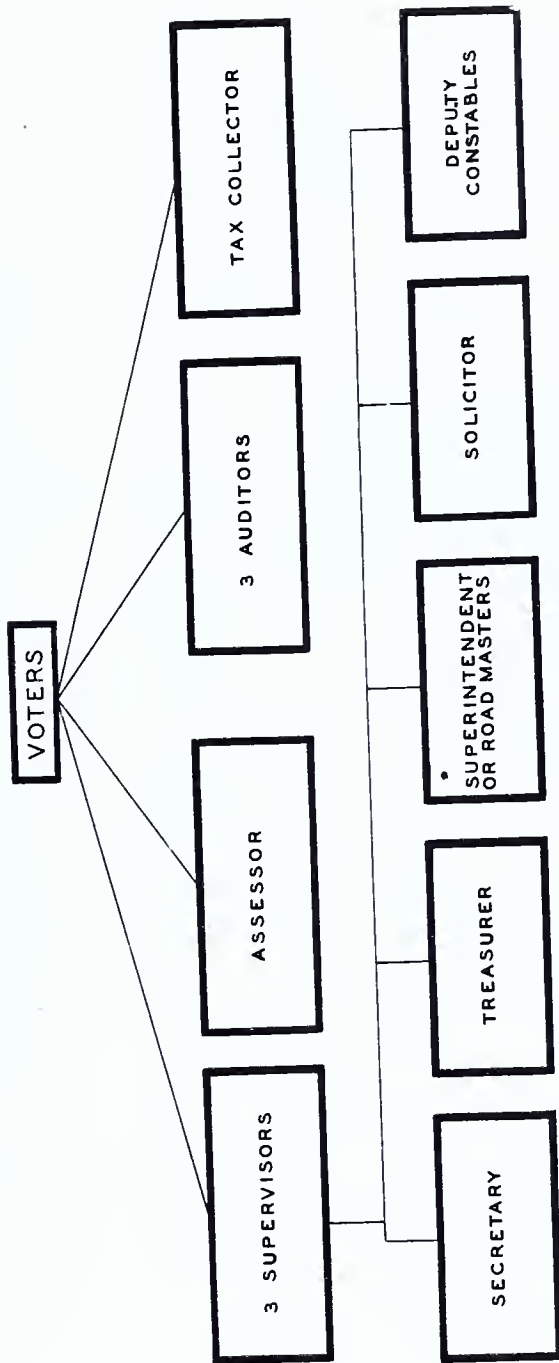
Regulation and inspection of buildings, inspection of the milk supply, regulation of the use of inflammable and explosive articles, smoke regulations, providing motor ambulances, regulation of amusements, registration of real estate, regulations for the public safety, creation of fire, water and sewer districts, fire prevention regulations, regulation of the running at large of animals, provision of comfort and waiting stations and drinking fountains, health protection, sewage disposal, and

ORGANIZATION CHART - TOWNSHIPS OF THE FIRST CLASS PENNSYLVANIA



SPB

ORGANIZATION CHART - TOWNSHIPS OF THE SECOND CLASS PENNSYLVANIA



* POSITIONS NOT INCOMPATIBLE WITH POST OF SUPERVISOR, AND FREQUENTLY HELD BY SUPERVISORS



ORGANIZATION CHART - CITIES OF THE THIRD CLASS PENNSYLVANIA

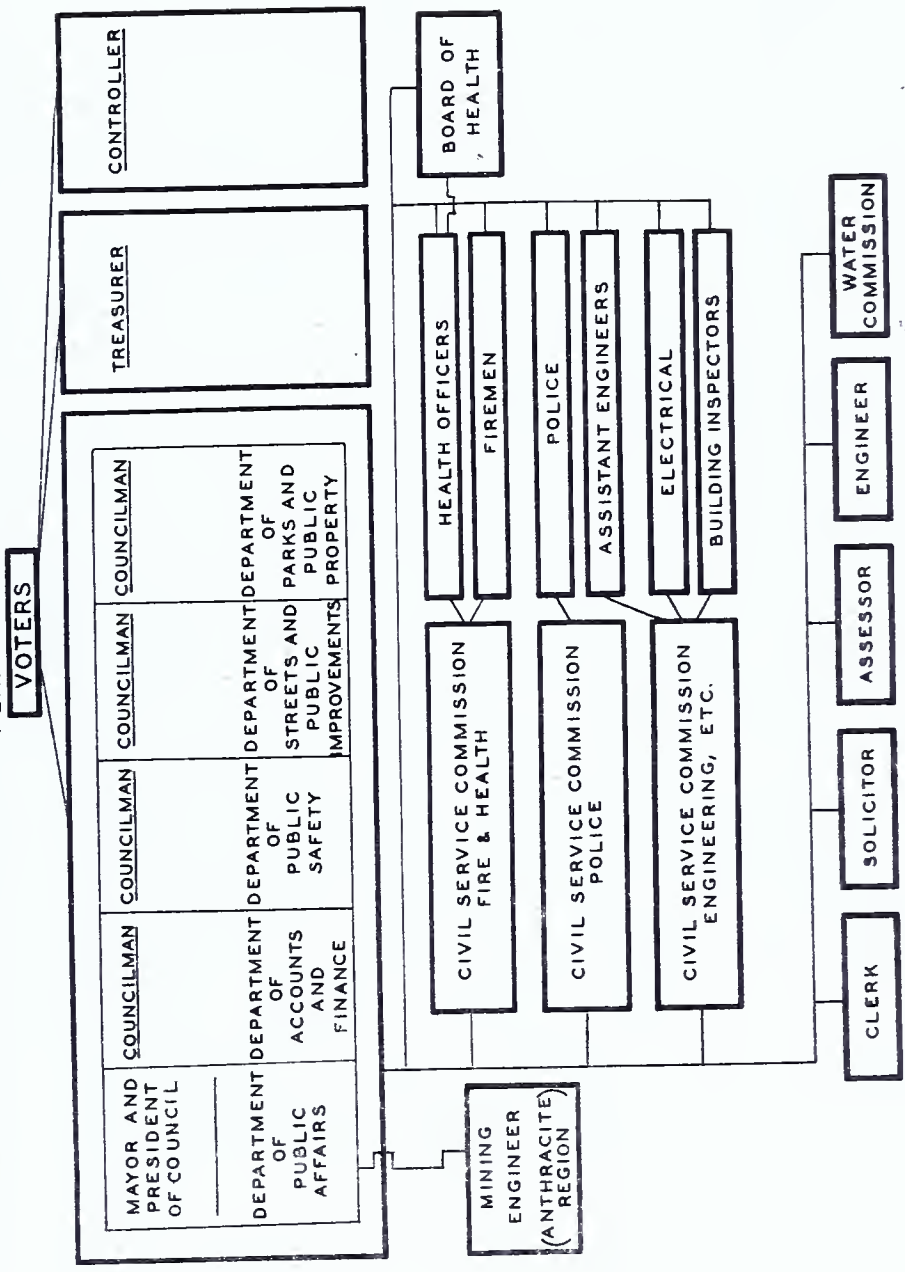


FIGURE NO. 120

ORGANIZATION CHART - BOROUGHS

PENNSYLVANIA

VOTERS

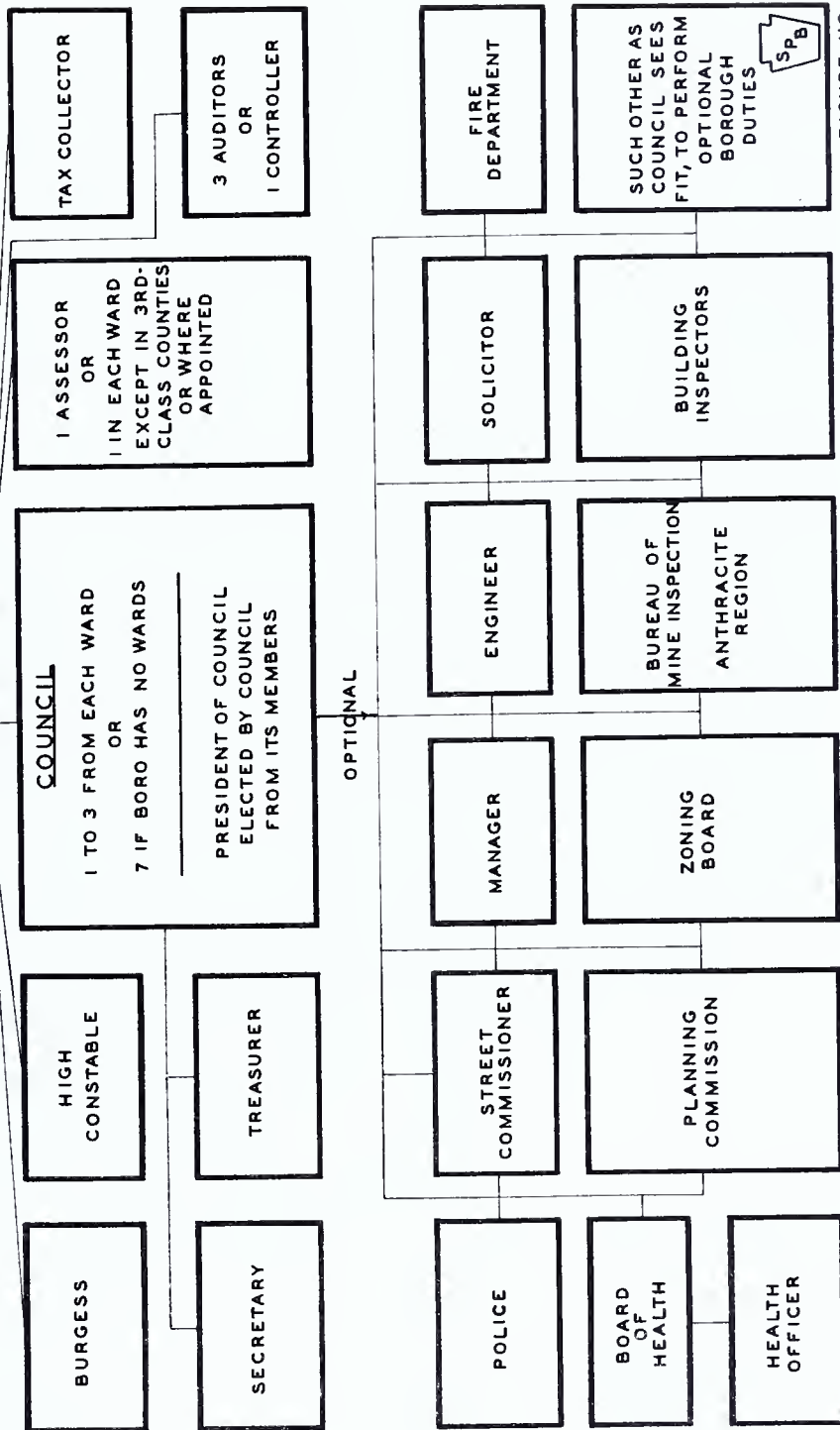


FIGURE NO. 121

creation of shade tree commissions and zoning and planning boards.

In addition the commissioners have broad powers to enact ordinances and resolutions and enforce them.

Elasticity in the government of first class townships is shown in the organization chart. The voters elect one commissioner from each ward (of which there may not be more than 15) or enough at large so that there shall be at least five commissioners. A treasurer, assessors and three auditors or a controller also are elected. It is optional for the commissioners to appoint one qualified accountant as auditor. A secretary appointed by the commissioners completes the minimum organization.

The first class township code, Act of June 24, 1931 P. L. 1206, section 1501, authorizes the commissioners "To create any office, position or department which may be deemed necessary for the good government and interests of the township" Other sections specifically mention various offices or boards which the commissioners may create. Some of the optional offices which have been created in many first class townships are shown at the bottom of the organization chart.

A provision of the first class township code utilized by only one township, allows the commissioners to adopt the manager system of government by ordinance, but not by direct vote of the electorate. The commissioners may create the office of manager, and define his powers, duties, term and compensation. They may delegate "any of their respective non-legislative and non-judicial powers and duties to the township

manager."

The mandatory functions of boroughs are the same as those of the townships. Some small boroughs confine their customary activities closely to their mandatory functions, especially in years when the tax burden is unusually onerous.

Boroughs may perform any optional functions of townships of either class, and the following in addition:

Provide for putting electric wires underground.

Manufacture and supply electricity.

Operate gas wells for municipal purposes.

Establish airports.

Regulate weights and measures.

Make annual appropriations up to \$1,000 for municipal music, and up to \$500 for municipal burial ground maintenance.

Widen and deepen watercourses.

Erect and maintain wharves and docks.

Contract with street railways for the removal of tracks.

Inspect mines as to surface support in the anthracite region.

In the organization chart for boroughs the upper half of the chart shows the minimum legal organization. The lower half lists the optional offices and boards most frequently created. The borough council has a broad grant of power to create such additional offices and departments as it sees fit.

A majority of the boroughs have populations as small as the majority of second class townships. Ordinarily, however,

the borough population is concentrated in a smaller area than that of the townships. Hence most small boroughs have been created to render governmental services which their residents could not so easily obtain under township government. Such boroughs commonly set up only the minimum legal organization plus a board of health, a fire company equipped or supported at least partially at borough expense, a borough water or sewer system, or a public market.

The minimum borough organization does not differ greatly from that of a first class township. Both have elected assessors and auditors or a controller and an appointed secretary. The elected township treasurer has the combined duties of the elected borough tax collector and the appointed borough treasurer. The high constable of the borough might well be dispensed with.

The borough council corresponds to the township board of commissioners. If a borough has no wards it elects seven councilmen; if there are wards, from one to three councilmen are elected in each. New wards may be created upon petition at the discretion of the Court of Quarter Sessions.

The burgess, who has no counterpart in the township, may veto ordinances or resolutions of council, although his veto may be overruled by two-thirds of council. He has the powers of a justice of the peace in enforcing borough ordinances and in respect to riots, tumults, disorderly meetings, vagrants and disorderly persons within the borough. His princi-

pal duty is to preserve order, enforce ordinances and regulations, hear complaints, remove nuisances and exact a faithful performance of the duties of the officers appointed. He also has charge of the police, and may suspend policemen without pay until the succeeding regular meeting of council. Council, however, has the sole power of appointment and removal. This division of authority frequently leads to friction between the burgess and council.

The larger boroughs, 49 of which are as large as the majority of third class cities, perform many more of their optional functions and have created a wide variety of offices. The borough law, permits appointment of a borough manager, to whom the council and burgess may delegate, subject to recall, any of their respective non-legislative and non-judicial powers and duties. Approximately 20 boroughs, most of which have 5,000 or more inhabitants, have exercised this option. In other boroughs another official, usually the engineer or secretary exercises approximately the same powers.

ADMINISTRATIVE METHODS.

The administrative methods of local sub-divisions may be treated under five headings, namely, the supervision of administration, personnel methods, purchasing, accounting, and budgetary control.

1. Supervision

County commissions fix the tax levy for the county, and draw warrants for all payments of county funds. They share

their financial authority, however, with several other elective officers. They are required by law to pay prescribed salaries for many of the chief county officers and to appropriate money for many purposes over which they have no control. Professors Weaver and Alderfer found, for example, that in 1931 mandatory expenditures of sixty-four counties ranged from 18.7 per cent of all expenditures in McKean County to 86.3 per cent in Mifflin County. In thirty five counties mandatory expenditures accounted for more than 40 per cent of all expenditures. Professor Carter arrived at similar findings in his study of the expenditures of twenty-nine counties in 1930.

Weaver and Alderfer list twenty-three varieties of public works projects where the commissioners share authority with some other agency. This may be a group of petitioning citizens, board of viewers, grand jury, judge or judges of the Court of Common Pleas or of Quarter Sessions, electorate, poor directors, controller, or such State departments as those of Health, Welfare, or Highways. Each elected officer is virtually supreme so far as control by any other county authority, except the Salary Board, is concerned. Supervision over some activities is exercised by administrative agencies of the Commonwealth, however.

The county controllers are largely responsible for seeing that expenditures are made legally. In the other counties, the auditors annually examine the accounts of the county fiscal officers and of the directors of the poor where the poor dis-

trict is on a county-wide basis.

Supervision of administration is much more centralized in townships, boroughs and cities, although in none of these units is there any single officer who is solely responsible for the conduct of municipal affairs. In townships of the first class and boroughs the administration of public affairs is ordinarily supervised by committees of the legislative body. Sometimes an appointed official, such as the secretary, engineer, street commissioner, or manager is allowed or directed to exercise supervisory authority over all or most of the other appointed employes, and to supervise construction and maintenance of public works, subject to the direction of the legislative body. Where this situation exists the most efficient administration usually is found. Occasionally the president of council or chairman of the finance committee performs more or less the same duties. In second class townships the three supervisors are not over-burdened with administrative duties. Some confusion arises in third class cities because the council has administrative powers which are allotted to the individual members, while the mayor is authorized to supervise the work of all city officials.

2. Personnel Problems.

The chief personnel problems have to do with selection and payment of officials and their tenure in office. There is no general provision for the selection of public officials on a merit basis except for some employes of the third class cities.

The worst situation exists in counties where the decentralization of authority leads to over-staffing of many offices. Appointive positions in second class townships frequently are filled by the supervisors themselves. In first class townships and boroughs, officials originally chosen for political reasons often have a surprisingly long tenure in office. This depends to a great extent upon the ability of the party or faction in power to maintain its position. Even the civil service commissions in third class cities usually are ineffective in securing the most competent persons for public office. Many examinations given are so simple that nearly any candidate can qualify, and the provision whereby the appointing officer may nominate to council any one of four persons whose names are submitted by the civil service commission permits the appointment of politically desirable candidates.

The statutes sometimes provide minimum qualifications for specified officials. Thus the borough code provides that the controller shall be a "competent accountant". Unfortunately such terms as "competent" are subject to many interpretations.

The fact that so many administrative officials are elected is another weakness of local government, especially in the counties. Voters are poorly equipped to judge qualifications of candidates for technical administrative positions. Persons so selected are prone to do their work poorly unless competent assistants are hired to do it for them.

There is no uniformity in salaries for similar services.

Thus commissioners and supervisors of first and second class townships are paid on different per diem bases, while councilmen in third class cities receive salaries within a range prescribed by law and members of borough councils are paid nothing. Borough treasurers, even in large boroughs, often are unpaid whereas in other boroughs they receive relatively substantial salaries.

This situation is complicated by the fact that salaries of many local officials, including most county officers, are fixed by State law. Another factor is the fee system, which results in over-payment of some officials and under-payment of others.

3. Purchasing.

There is great diversity in the purchasing methods in use in the various local government units. The system in each community is almost entirely optional with its legislative body. In counties, each department head purchases many of his own supplies with little or no centralized supervision. In smaller sub-divisions purchasing is commonly left to the committee of the legislative body in charge of a particular function. In cities purchasing bureaus are authorized by law but few, at least of the smaller cities, have them. Ordinarily each department head purchases his own supplies. Occasionally a city, borough or township empowers one officer to make or negotiate all purchases. Regardless of how purchases are made they must be approved and authorized by the legislative body. Competitive bidding is required by law in the case of purchases involving

the expenditure of \$500 or more.

4. Accounting

Except in the case of townships, which are required to submit uniform reports to the Department of Highways, there is no uniformity in the accounting systems of any of the kinds of local governments. There are some units in each class which have excellent bookkeeping systems, which clearly reflect the financial situation of the unit. More commonly the only accounts kept are on a single entry cash basis with practically no classification of expenditures.

5. Budgetary Control

No satisfactory budgetary system is required by law for any of these kinds of local sub-divisions. Decentralization of the counties and diffusion of powers among the various officers make proper budgeting difficult. In the other kinds of units no person is made responsible for the preparation of a budget. In no class of units are public hearings required in advance of the adoption of a budget. In the case of the boroughs the code does not even mention budget making. Where the law provides that a budget be adopted or a tax rate fixed there is no uniformity as to the date. Furthermore, only in the county and third class city laws is there any reference to budgetary control of expenditures after adoption of a budget. Hence practices vary greatly. In many small units, most expenditures recur so regularly that it is satisfactory to fix the same tax rate with slight variations from year to year. This leads

**Governmental-Cost Payments of Counties, Cities, Boroughs, and Towns,
School Districts, Townships, and Poor Districts. 1932**
(Totals expressed in thousands of dollars)

COUNTY AND OTHER CIVIL DIVISIONS	Total	General govern- ment	Protec- tion to person and prop- erty	Health and sani- tation	High- ways	Chari- ties, hospi- tals, and correc- tions
GRAND TOTAL	681,925	47,534	47,392	19,802	66,064	53,080
State government	165,691	10,023	8,762	3,749	20,872	22,957
Counties (b)	80,418	18,763	2,476	307	9,539	11,900
Cities, boroughs and towns (a)	219,705	18,049	36,154	14,960	22,708	10,768
School districts	167,046	699	766			
Townships	19,645				12,965	
Poor districts	8,315					7,455

COUNTY AND OTHER CIVIL DIVISIONS	Schools Libraries	Recre- ation	Miscel- laneous	Opera- tion and mainte- nance of public service enter- prises	Interest	Out- lays
GRAND TOTAL	199,076	6,959	13,337	9,608	59,006	155,161
State Government	45,636	317	4,270		2,810	41,609
Counties (b)	110	737	1,917	37	8,971	25,661
Cities, boroughs and towns (a)	3,524	5,744	5,622	9,536	32,222	60,398
School districts	149,806	161	1,528		12,586	21,500
Townships				14	1,491	5,375
Poor districts					257	603

a Includes for cities, boroughs, and towns not reporting a distribution by departments
an estimate based on the average for cities, boroughs, and towns of the same group.

b Exclusive of Philadelphia County

(Statistics from Financial Statistics of State and Local Governments; 1932.
Pennsylvania U. S. Dept. of Commerce, Bureau of the Census. 1934)

Revenue Receipts of Counties, Cities, Boroughs, and Towns,
School Districts, Townships, and Poor Districts. 1932
(Revenue receipts expressed in thousands of dollars)

COUNTY AND OTHER CIVIL DIVISIONS	Total	Total	TAXES		Special Assessments
			General Property	Licenses and Permits	
GRAND TOTAL	626,564	a481,255	b340,372	81,752	5,750
State Government	169,841	a132,639		73,508	
Counties (c)	63,542	56,422	50,395	6,027	
Cities, boroughs, and towns	181,189	129,424	127,228	2,196	5,442
School districts	182,452	139,353	139,353		
Townships	21,014	17,525	17,504	21	308
Poor districts	6,980	5,892	5,892		

Fines, for- feits, & escheats	Subven- tions & grants	Dona- tions, gifts, & pension assess- ments	Highway privi- leges, rents,& interest	Earnings of general depart- ments	Earnings of public service enter- prises
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COUNTY AND OTHER
CIVIL DIVISIONS

GRAND TOTAL	1,758	50,315	4,668	29,006	33,181	20,631
State Government	367	13,927	3,843	6,166	12,899	
Counties (c)	432	90	53	1,634	4,904	7
Cities, boroughs, and towns	887	2,120	755	18,852	4,635	19,074
School districts	6	31,971	14	2,231	8,877	
Townships	66	1,842	2	71	1,187	13
Poor districts		365	1	43	679	

a includes inheritance taxes and other special taxes for state purposes only.

b includes poll and occupation taxes

c exclusive of Philadelphia County

(Statistics from Financial Statistics of State and Local Governments: 1932.
Pennsylvania U. S. Dept. of Commerce, Bureau of the Census. 1934)

to serious difficulties, though it is frequently followed in the more populous and active communities.

SOURCES OF REVENUE

No State department publishes or even collects complete financial statistics of all the various sub-divisions of the Commonwealth. The Department of Public Instruction collects uniform statistics concerning finances of school districts, sufficiently detailed to be of great value. Townships are required to submit similar reports to the Department of Highways. But while these reports must be made on uniform blanks, there is no required uniformity in bookkeeping methods. Cities and boroughs submit their annual financial statements to the Department of Internal Affairs. Few of these reports are comparable at all and some are valueless.

The most complete attempt to compile statistics concerning revenues and expenditures of local governments in Pennsylvania has been made by the Bureau of the Census of the U. S. Department of Commerce for the fiscal year, 1932.

Unfortunately poll and occupational taxes are grouped with taxes upon real property in the table of revenue receipts. This group, of which the tax on real property constitutes by far the major part, supplied 79.3 per cent of all the revenue receipts of counties; 70.2 per cent of those of incorporated cities, boroughs and towns; 76.4 per cent of those of school districts; 83.3 per cent of revenue receipts of townships; and 84.4 per cent of those of poor districts, or 74.8 per cent of the total

revenue receipts of all the sub-divisions of the Commonwealth.

Subventions and grants, mostly to school districts, account for 8.0 per cent of the revenue receipts of all the sub-divisions; highway privileges, mostly to incorporated places, account for 5.0 per cent; earnings of general departments for 4.4 per cent; those of public service enterprises for 4.1 per cent and minor items for 3.2 per cent. Practically all earnings of public service enterprises accrued to incorporated places. Licenses and permits, which yielded only 1.8 per cent of the total receipts in 1932, have become of increasing importance since the repeal of the 18th Amendment. At the same time the yield from the general property tax is dropping sharply.

LOCAL GOVERNMENT EXPENDITURES

Expenditures of local units in Pennsylvania for governmental purposes in 1932 were 29.8 per cent for schools, including a small amount for libraries; 22.0 per cent for permanent improvements; 10.8 per cent for interest; 8.8 per cent for highways; 7.5 per cent for protection to person and property; 7.3 per cent for general government; 5.8 per cent for charities, hospitals and corrections; 3.1 per cent for health and sanitation; 1.9 per cent for operation and maintenance of public service enterprises; 1.3 per cent for recreation, and 1.7 per cent for miscellaneous purposes. Expenditures for outlays were not subdivided by the Bureau of the Census but ordinarily such expenditures are incurred chiefly for highways, schools, and charities, hospitals and

corrections.

Outlays, general government, charities, hospitals and corrections, highways and interest account for nearly all county expenditures, - in this order. In incorporated places, outlays for protection to person and property, interest, highways and general government were most important. Township expenditures are almost wholly for highways, while those of school districts and poor districts are self-explanatory.

PROPOSALS FOR DEVELOPMENT

Future development of local government in Pennsylvania concerns the proper size of administrative districts, the proper agency to perform certain functions, the proper degree of centralization of authority, the proper allocation and development of revenue resources, and proper accounting procedure.

An administrative district should be of the size most suitable for efficient performance of its functions. This is not always easy to determine, but certain glaring cases of maladjustment are evident and should be corrected.

There is no reason for the creation of a new separate school district whenever a new borough or township is created, nor for the continued existence of many small school districts. There is no more reason why a poor district should have the geographical boundaries of a township or borough.

In view of modern means of transportation and methods of balloting, a survey should be made to determine which election districts are uneconomically small. Further steps might then

be taken to redistrict the State on a more scientific basis for election purposes. This would require the cooperation of the county judges, who under the present Constitution, have final authority in fixing the boundaries of such districts.

It might also be advisable to change the constitutional provision for the election of justices of the peace and constables in every township, ward and borough. Larger districts also are suggested for the minor judiciary together with a requirement that justices be trained in the law.

An alternative to changing the size of existing governmental districts is to transfer functions. Suggested changes follow:

To transfer the construction and maintenance of highways from the townships to the Commonwealth. Since highway maintenance is now the chief function of the second class townships, such a step might easily lead to abolition of this type of unit. A less drastic step has been taken in Maine, where the state has assumed full responsibility for all local government activities in certain extensive but sparsely populated regions, abolishing the usual agencies of local government. A broader plan is the Wisconsin statute, which provides for county zoning. Typical zoning ordinances enacted under this law go so far as to prohibit family dwellings in forest regions. This makes maintenance of schools and some roads unnecessary in such regions and reduces the unit cost of providing these facilities in other regions.

survey might be made of conditions in those counties of Pennsylvania which are steadily losing in population to determine whether either plan is adaptable here.

Modern policing problems indicate the need for further expansion of the State police system and, perhaps, even for the eventual relinquishment of this entire function to the Commonwealth.

In "The Collection of Local Taxes in Pennsylvania," Professor Nicholson has shown that the present system of collecting taxes through locally elected collectors paid on a fee basis costs the taxpayers of Pennsylvania from four to five times as much as the taxpayers of Ohio pay for the collection of approximately the same amount by a single official in each county who is paid a straight salary. This situation could be improved by authorizing the county treasurer or some other county officer to collect taxes levied by all subdivisions of the county. Similarly, the present decentralized system of assessing property, with its variations in rates, could be improved by more centralized control along the lines already provided for in counties of the second and third classes. Also, present procedure whereby property in cities of the third class is assessed separately by city and county assessors should be changed.

Substantial savings and increased efficiency in the conduct of county affairs would result from a thorough reorganization of county government, eliminating many elective officers

and vesting far-reaching administrative authority in the hands of a strong executive. This, however, would require constitutional changes.

Nevertheless, a number of county offices, particularly in the field of welfare have been created by the Legislature and may be abolished by the General Assembly. A survey should be undertaken to determine whether these welfare agencies, such as the Mothers' Assistance and poor boards, could not be merged into a single county-wide agency to prevent duplication of effort and cut expenses.*

Neither the counties, cities, boroughs nor townships have any real executive head. It would be desirable to make one officer more definitely responsible for preparation of the budget, routine purchasing and personnel management. Civil service systems for the selection and promotion of employees on a merit basis should be provided for the larger units and definite professional qualifications should be required of all technical employees in all units.

A complete investigation should be made to determine which mandatory laws are desirable and likely to continue to be so, and which impose undue hardships. Such a study should determine what justification there is for the salary scales and fee bases now prescribed by law and should ascertain whether such matters should not be left to local determination.

* For fuller discussion see section on this subject.

The recent great increase in the scope of governmental activities, supported almost 75 per cent by taxes on real property, has placed such a tremendous burden upon property owners that increasing numbers are unable to meet their obligations. Hence current debts of the local government units are increasing rapidly and many units are in default on their bonded indebtedness. As of June 25, 1934, thirty units were in default as to either bonds or interest, and the Bureau of Municipalities in the Department of Internal Affairs listed 97 other units which had recently been in default but which had adjusted their obligations.

The situation has led local governments to demand more sources of revenue. Liquor and other licenses have helped somewhat but have been insufficient. There are not many taxes capable of yielding substantial revenue which are suitable for local administration except the general property tax. Hence it probably will be necessary to levy either a State income tax or sales tax, or both. If this is done, there should be a careful investigation to determine whether it is better to leave the administration of the functions now performed by local units in their hands or to transfer some of them to the Commonwealth.

A similar situation in North Carolina has led to a re-allocation of the functions of government whereby highways and schools are supported by the state from the proceeds of increased gasoline and income taxes. At the same time the state

created a Local Government Commission and a Director of Local Government. They have wide powers to supervise local finances, install uniform accounting systems, pass upon and market all bond issues, and pass upon the qualifications of municipal accountants. Their efforts have resulted in tremendous savings, improvement in the bond market for North Carolina local government bonds, and reduced interest rates.

A strong agency to pass upon the necessity for bond issues is a desirable institution, for one of the most burdensome expenses of local governments is the fixed charges upon the debts they incurred in more prosperous years when they should have been reducing their debts.

PERSONNEL SUGGESTIONS

"Accounting systems do not run themselves and adequate training and experience are essential to the proper handling of accounts and finances of local governmental units. In order to obtain the right kind of personnel, it is recommended that:

"(1) Colleges and universities establish courses of study for training employes for local governmental units.

"(2) Local government employes charged with handling accounts and finances be selected on a merit basis under some sort of civil service plan.

"(3) Local government employes receive adequate salaries and be given a reasonable tenure of office.

"(4) No financial or accounting employes be elected or be subjected to politics.

ACCOUNTING SUGGESTIONS

"It is recommended that some agency in the State government be given authority to prescribe the essential features for the proper system of accounts and procedure to be adopted by local governmental units. The writer believes the following essential features are minimum requirements:

"(1) Uniform System and Classification of Accounts. A reasonably uniform but flexible classification of accounts and system of records should be worked out by experts thoroughly familiar with the general requirements of governmental accounting and with the conditions present in this State. It would, of course, be necessary to have somewhat different systems in different units. For example, a system of accounts suitable for a county could not be used for a borough. All systems and classifications should be made flexible enough to be readily adapted to local needs and conditions.

"(2) Double Entry System of Books under Supervision of a Responsible Official. The use of double entry principles of bookkeeping by competent employes gives some degree of assurance that all business transactions will be analysed in a complete manner, that coordination of all financial activities in the records will be brought about and that proper financial statements can be prepared from the books.

"(3) Fund Accounting. In governmental accounting it is important that funds be kept separate in the records and in

fact. For example, if special assessments are being collected for local improvements or taxes are levied to provide interest and principal to retire bonds, it is important that such funds be kept intact and used only for the purposes for which such funds were created. Illegal transfers and borrowings as between funds have produced disastrous results in many communities.

"(4) Accrual Basis of Accounting. The essence of this basis is to account for income or revenue in the period in which it is earned and to account for expenses in the period in which the liability is incurred. This principle is to be followed regardless of when the actual receipt or disbursement in cash may occur. In other words each accounting period must stand by itself and reflects only the income earned and expense incurred in the period under review. Professor Lloyd Morey, an authority on Municipal Accounting, in an address to the Municipal Finance Officers Association, referred to the accrual basis as follows:

"Its importance and its correct solution have been recognized, yet governmental accounting in general is still carried out on the cash receipt and disbursement basis. It is high time that governmental officers and public accountants took the matter in hand and settled it once and for all. No one would think of accepting cash receipts and disbursements as representing an adequate accounting basis for private business. No more should it be considered acceptable in

in public than in private business. Only by this method can an accurate exhibit be made of the operations of a given period and the resources and liabilities at the end of the period.

"(5) Budgetary Control. A proper system of budgets and budgetary control should be worked out in conjunction with the general accounting system. This will provide an effective plan for estimating revenue and keeping expenditures within the revenue. It will provide for checking actual performance with the budgeted items of revenue and expense.

"(6) Periodic Financial Reports. Accounting is not an end in itself but exists only because of the aid which it can render to management, creditors, investors, public officials and taxpayers. It is essential, therefore, that periodic financial statements be issued at regular intervals. These statements should set forth in as simple and as clear a manner as possible the essential facts regarding the financial condition and operating results of the governmental units. The reports should be made monthly or at least quarterly for the guidance of administrative officials, creditors, bondholders, citizens and taxpayers. The reports should include as a minimum requirement the following:

"(a) Balance sheet showing a summary of all assets, liabilities and proprietary accounts for each fund, such as general fund, special assessment funds, sinking funds, etc.

"(b) Statement of revenue and expense items in the various funds, together with supporting schedules of the de-

tails by departments and budget classifications.

"(c) A summary of Cash Receipts and Disbursements by Funds, showing opening balances and closing balances reconciled with bank accounts.

"(7) Cost Accounting Systems. The local governmental units can profit much by establishing proper systems for cost analysis. The study of unit costs of various services and departments of governmental units will promote efficiency and economy. These costs can be compared with costs of prior periods, with costs of other governmental units and with predetermined standards set in the budget for the year under review. Such systems to be of the greatest value must be coordinated with the general accounting system.

"(8) Government Owned and Operated Institutions and Utilities. Where local governments operate colleges, libraries, hospitals or public utilities, the accounting procedure and standards for such enterprises should follow the best standards and practices in use by similar private institutions or enterprises.

"It is realized that certain small school districts and townships may be too small to adopt all of the foregoing but the counties and most of the boroughs and small cities surely need these minimum requirements.

AUDITING SUGGESTIONS

"The present policy of electing auditors and paying them five dollars a day does not produce satisfactory results for

borough, township, schools, school districts and counties in Pennsylvania. The essential requirements are:

"(1) To secure competent auditors.

"(2) To prepare audits and audit reports in accordance with some standard specifications.

"One way of obtaining competent men is to have the municipal auditing work performed by Certified Public Accountants. The work should be awarded on the basis of professional skill and reputation but not on the basis of competitive bidding.

"Another plan is to have a staff of auditors trained and working under some office or bureau of the State. Unless these jobs are held by trained men who are not subject to politics the work will not be performed very satisfactorily. In New Jersey, only those who are registered and licensed as Municipal Accountants may make audits of governmental units. Licenses are issued annually by the New Jersey State Board of Public Accountants. Such a procedure is in marked contrast with conditions in Pennsylvania. When the State staff is not large enough to do the job all at once, either the work must be spread over the year or temporary help must be obtained for the peak load.

"One of the reasons for the wide differences in fees when bids are called for in connection with municipal audits is the character and amount of work which will be done by the various auditors. The only way to insure a

satisfactory audit is to establish some standards or specifications as to the scope and character of the investigation to be made. It is understood that the National Committee on Municipal Accounting proposes to develop a standard program for Municipal Audits.

REVISION OF LAWS

"It will be appreciated that many of the foregoing suggestions cannot be adopted without legislation. It would seem, therefore, that a study of the legal situation should be made by a committee of accountants with the aid of legal counsel. In the opinion of the writer the following are the major tasks of such a committee:

"(1) Codification of such existing laws as seems desirable.

"(2) Framing of legislation to require properly trained employes, proper accounting procedure and audits by Certified Public Accountants."

GENERAL CONCLUSIONS

The conclusion seems obvious that local governmental units in Pennsylvania need to be reorganized in terms of the functions to be performed. This reorganization would involve a decrease in the number of existing units and layers of government, with increase in the quality of the leadership and personnel and reduction in relative cost of administration.

Many of the counties of Pennsylvania are now too small to perform with efficiency or economy the functions of county gov-

ernment. Relatively few of the school districts of Pennsylvania are large enough either to provide or to administer efficiently a modern program of education. The number of school districts could be substantially reduced with resultant large savings in the cost of education and large gains in the quality of the educational program, particularly in rural areas and small towns. In general, the problem of local government in Pennsylvania resolves itself into the organization and integration of the subdivisions of government into fewer but more competent functional units, so that a re-distribution of powers as between the State and its subdivisions may be made on a basis which will at once insure efficiency and economy and at the same time, preserve the advantages of local participation and initiative.

A PLANNED PROGRAM OF PUBLIC EDUCATION FOR PENNSYLVANIA*

Foreward

Any attempt to form a precise picture of our State program of public education ten years hence is unwise. Rapidly changing social and economic conditions make uncertain both our future educational needs and our future educational possibilities.

Our present wide-spread unemployment would normally tend to increase the demand for educational service, but such growth is opposed by the economic stress which restricts severely the educational service possible to maintain.

The gradual mechanization of industry resulting in a growing leisure for everyone, would, other things being equal, tend to increase enrollments in schools and colleges. Whether such results will follow, however, will be determined largely by the degree to which educational opportunities offered succeed in meeting the every-day practical and cultural needs of the public.

Moreover, the point of diminishing returns in public education remains to be determined. We have yet to ascertain just what per cent of our total population can be educated by society with profit to itself. We are divided as to what should constitute a foundation program of public education to

*Prepared by A. W. Castle, Director, Extension Education Division, Department of Public Instruction, from material gathered by Committees of the Commission to Study the Educational problems of Pennsylvania, James N. Rule, Superintendent of Public Instruction, Director. Mr. Castle was the Executive Secretary of this Commission.

be required for all. We are not agreed as to the minimum program of free public education to which everyone should have a right. Neither are we clear as to the extent to which the State should assume responsibility for higher education in a program of training for leadership.

However, of some changes we may be reasonably certain. The projection of present trends will reflect, with some degree of accuracy, the direction of developments in the immediate future. Educational needs now apparent will tend to determine the organization, administration, and substance of public education in 1945. Inequities now known will be partially or wholly corrected in the then current practice. During the past century since the birth of free public education in Pennsylvania, our changing philosophy of life has tended constantly to enlarge rather than to restrict the responsibility of public education for individual and social well-being.

Regardless of the many variable factors involved and the unanticipated educational demands and problems of the future, the adequate meeting of educational needs now apparent, and the correction of inequities now known, should constitute the absolute minimum of progress in the development of our educational program which will be discernible ten years hence.

Recognition is given to the members of the various study committees of the Commission for the Study of Educational Problems in Pennsylvania, to the officials of the several bureaus of the State Department of Public Instruction, and to other

authorities, from the contributions of whom the conclusions and factual data of this report have been drawn without reserve.

A TEN-YEAR PROGRAM OF EDUCATION FOR PENNSYLVANIA

In education, as in any other public service, planning is essential to progress. We cannot very well arrive until we have decided upon our destination. We should know definitely where we want to go and quite as definitely why we wish to go there.

Prompted by these convictions, the State Superintendent of Public Instruction moved, in 1931, to develop for Pennsylvania, a ten-year program of public education. To this end, in June of that year, the Superintendent of Public Instruction appointed, with the approval of Governor Pinchot, a Commission for the Study of Educational Problems in Pennsylvania, as a first step in the formulation of such a program.

This Commission consists of twenty-nine outstanding educational leaders representing the various levels and departments of education. The purpose of this study of educational problems, now continuing, is to secure accurately-determined facts as to our present and projected educational needs, as a basis for formulating a sound ten-year program of educational policy and procedure for the Commonwealth.

Under the direction of the Commission, major study committees have attacked the problems of educational objectives and principles; of school administration; of school finance; of teacher preparation; of school legislation; and of instructional programs and procedures in the fields of elementary education, secondary education, higher education, and extension education.

As a means of directing the attention of the members of scores of committees and sub-committees now engaged in this study, the administrative objectives in education which are mandated for Pennsylvania by constitutional and legislative provisions were summarized as follows:

Pennsylvania's Educational Charter

For every child in Pennsylvania protection of his constitutional right to an education.

For every child an understanding, competent teacher.

For every child an adaptable educational program -- instruction and practice in how to become a competent citizen -- training and guidance to do some part of the world's work well -- activities for the development of worthy home membership, wise use of leisure time, health, culture, and character.

For every child a school term sufficient in length to enable him to profit to the full extent of his capacities from opportunities offered by education.

For every child safe, sanitary, hygienic, and properly equipped school buildings and grounds.

For every citizen of the Commonwealth provision for a continuing education -- to make up for opportunities lost in earlier years and to provide means whereby the individual may adjust himself to new civic, social, and economic responsibilities.

These intended outcomes of the study of educational problems now being prosecuted, supplemented by successive inventories of a like nature, should establish a common philosophy with clearly-defined objectives, and insure to Pennsylvania the permanent benefits of a planned program of public education for the Commonwealth.

Chronological Development of Education in Pennsylvania

It is of interest that Pennsylvania, celebrating at this time the conclusion of its first one hundred years of free public education, should inaugurate its second century of public instruction, by an inventory of the problems, policies, and achievements of its past as a basis for greater progress in the future. From the prevailing convictions of former generations which found expression in constitutional and legislative provision, can be learned the policies and purposes which have brought our Commonwealth to its present greatness.

The growth of a definite philosophy of education can be traced through successive years in a chronological chart to be found in an appendix to this section.

In the legislative high spots in the development of public education in Pennsylvania, one finds the source and basis of State responsibility for -

1. A thorough and efficient system of public education for all children.
2. Protection of children in their right to attend school continuously until at least sixteen years of age.

3. Universal secondary educational opportunities for all youth.
4. Teacher preparation and certification.
5. Equalized educational opportunity for all regardless of age, economic circumstance, physical handicaps, or geographical location.
6. Establishment and maintenance of minimum standards in public education.
7. Local organization and administration of public education.
8. State aid in accordance with ability to pay.
9. Special aid to financially-distressed school districts.
10. Higher education in training for leadership.

ENROLLMENT IN PENNSYLVANIA

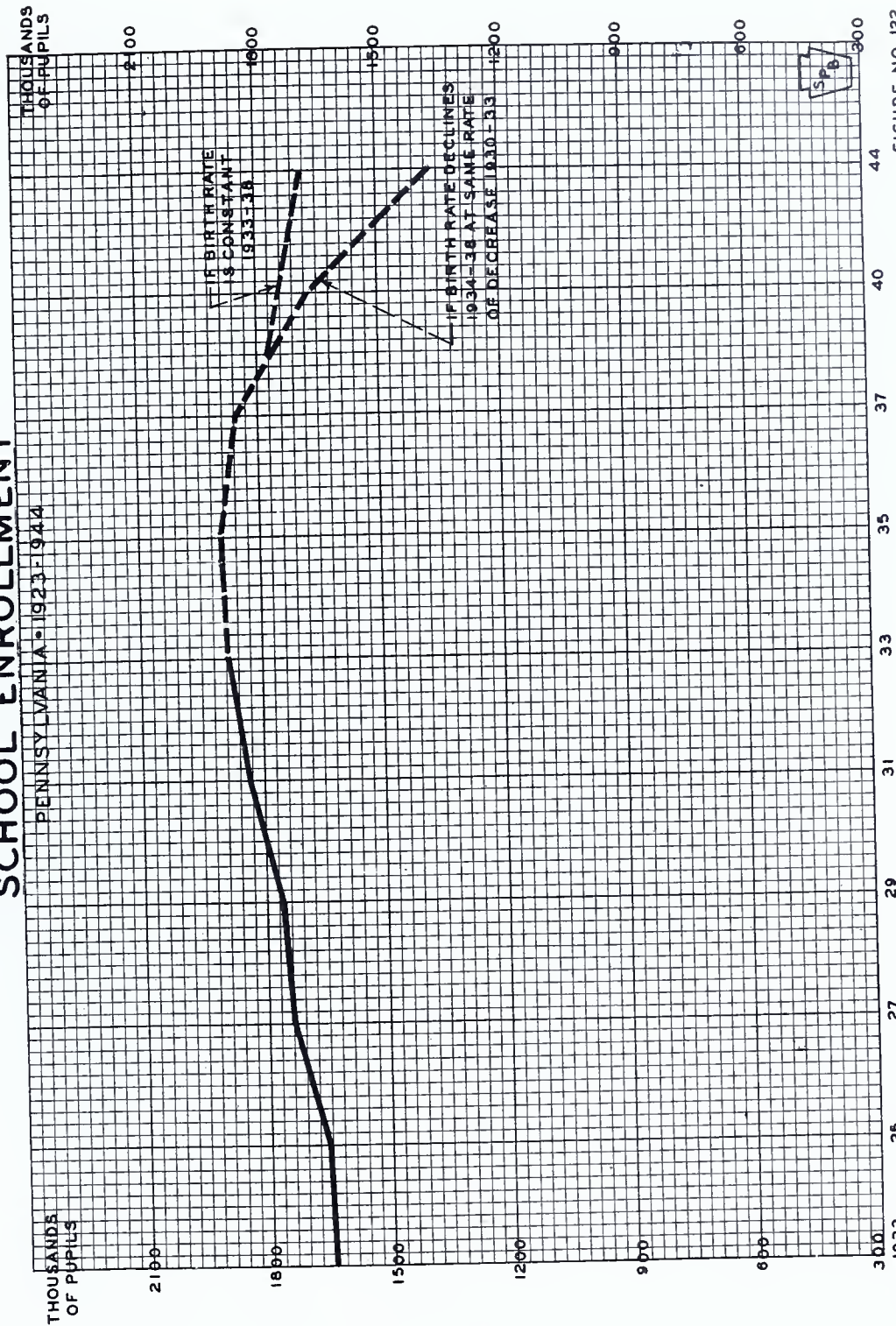
The following paragraphs treat of enrollment trends in public schools and colleges within the Commonwealth.

Total School Enrollment - The public schools of Pennsylvania, for the school year 1933-1934, enrolled 1,881,000 pupils distributed by grades as follows, - Grade 1 - 196,000, Grade 2 - 180,000, Grade 3 - 183,000, Grade 4 - 184,000, Grade 5 - 183,000, Grade 6 - 179,000, Grade 7 - 182,000, Grade 8 - 169,000, Grade 9 - 143,000, Grade 10 - 116,000, Grade 11 - 91,000, Grade 12 - 74,000.

The curves submitted herewith show actual trends over the past ten years, and probable estimates for the next ten years. With the uncertainty of population and economic conditions, any such estimate is liable to great error. In preparing these curves predicting school enrollment for the next ten years, the following assumptions were made -

SCHOOL ENROLLMENT

PENNSYLVANIA • 1923-34





1. Mortality prior to school enrollment, promotion rates, and elimination are assumed to continue for the next ten years at the same rate as at present.
2. Inter-state migration of families is assumed to balance each other in the numbers of children of public school age.
3. It is assumed that there will be the same number of births per year during the next four-year period as there were in 1933 as indicated by the regularly recurring plateaus of the birth-rate curve for the Commonwealth.

The projected curve in one figure indicates that if the birth rate and other factors are constant during the period 1933-1938, the total public school enrollment in 1944 will be approximately 1,730,000. On the other hand, if the birth rate declines during this coming period at the same rate of decrease occurring in the period 1930-1933, and other factors remain constant, the total public school enrollment in 1944 will be approximately 1,366,000.

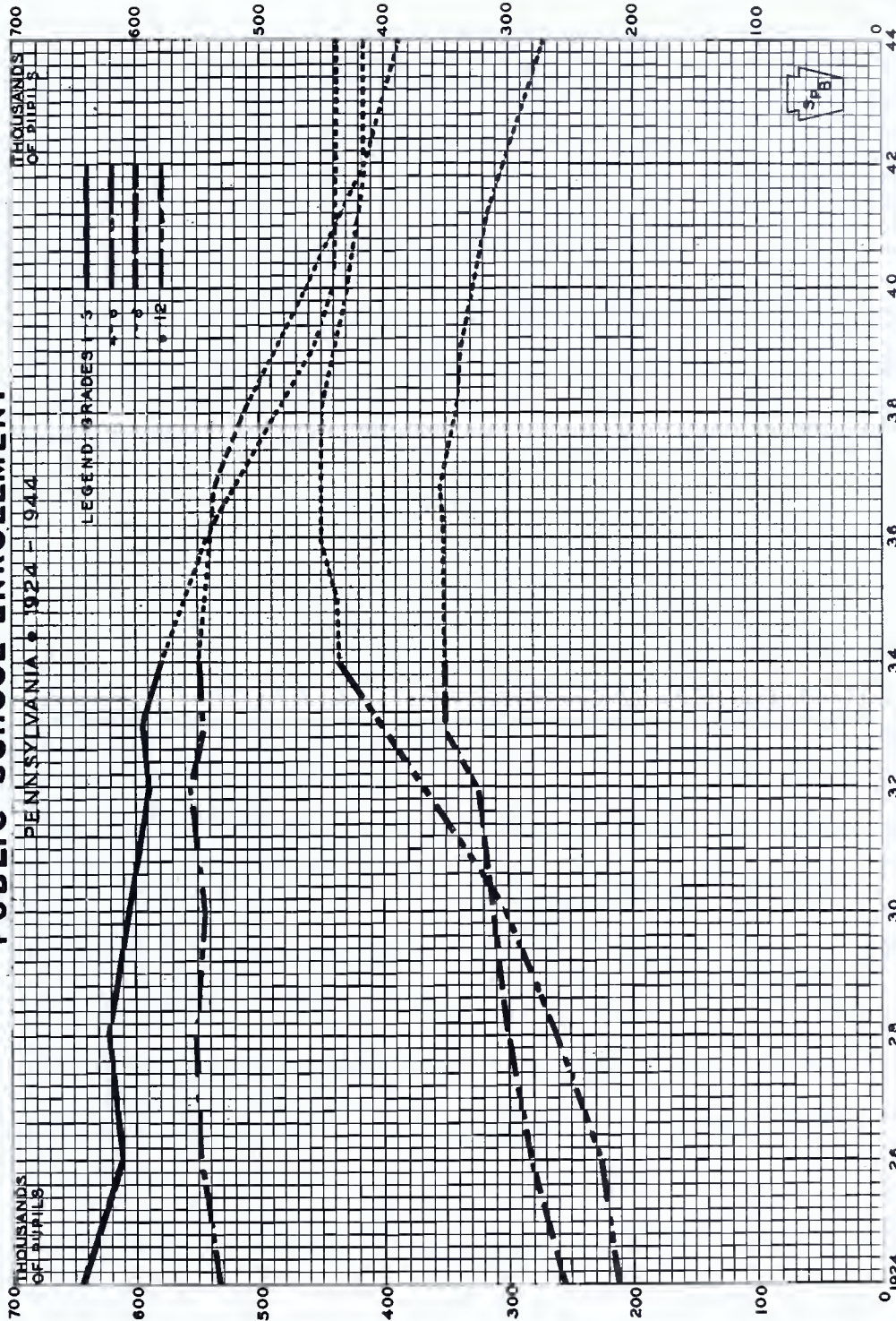
The second shows the actual public school enrollment trends from 1924 to 1934 by the following grade brackets, - 1 to 3 inclusive, 4 to 6 inclusive, 7 and 8, and 9 to 12 inclusive. The actual and projected curves show the following trends:

<u>Grade Bracket</u>	<u>Total Enrollment 1924</u>	<u>Total Enrollment 1934</u>	<u>Total Enrollment 1944</u>
Grades 1-3	644,000	558,000	330,000
Grades 4-6	533,000	547,000	380,000
Grades 7-8	255,000	351,000	269,000
Grades 9-12	214,000	326,000	387,000

It will be noted that during the last ten years Grades 1-3 have experienced a marked decrease in number, this decrease tending to continue to about 1940, at which time it reaches its plateau of stability. Grades 4-6 have maintained, during the past ten years, an approximate uniformity in enrollment, showing a decided drop from 1936 to 1944 under the influence of recent decreases in birth rate. Grades 7-8 have shown a definite increase during the past decade, seemingly having arrived at their peak in 1933, which is maintained until 1937, followed by a corresponding decrease in enrollment. Grades 9-12, representing the high school bracket, show a marked increase during the past ten years of approximately 52 per cent, approaching stabilization about 1936.

Recognizing the many variable factors involved and their tendency to alter projected enrollments, trends shown by the actual curves should have an important bearing in future policies in school-buildings programs and teacher preparation. For the Commonwealth at large, the actual curves of enrollment during the past decade show a diminishing demand for elementary

PUBLIC SCHOOL ENROLLMENT



school accommodations and a rapidly increasing demand in the field of secondary education, while the projected curves indicate a continued decrease in demand for the former and the present peak as approaching the point of maximum demand for the latter. These trends suggest conservatism and a careful study of local conditions in school-buildings programs.

These curves are not to be considered as a finished product. Corrections should and are being made for subsequent use in the final report.

Total Enrollment in Colleges and Universities - (Exclusive of State Teachers Colleges) - The actual curve of the figure showing total enrollment in colleges and universities, indicates a steady increase in enrollment from 55,000 in 1924 to 93,000 in 1930, dropping to 78,000 in 1932, rising to 102,000 in 1933, and falling to 93,000 in 1934.

The projected curve shows a relatively small but rather steady increase in total enrollment of colleges and universities from 1934 to 1940, at which time it is likely to reach its point of stabilization and thereafter, barring abrupt changes in social and economic conditions, will hover around 100,000.

Total Enrollment in State Teachers Colleges - (Being studied - to be reported later).

Total Enrollment in Extension Education - (Being studied - to be reported later).

Enrollment in Special Classes for Handicapped Children - Data on special education classes for physically-handicapped

children are not available for the State at large over the period 1924-1934. In view of this fact, recourse has been made to the records of Philadelphia, representing at this time over 30 per cent of the total State enrollment in this type of public education.

One of the accompanying charts indicates a rather constant increase in enrollment of handicapped children in these classes from 6,000 in 1924 to 11,000 in 1934.

In view of the relatively recent attention to this aspect of the Commonwealth's effort to equalize educational opportunity, few inferences can be drawn from the facts now available other than that for the Commonwealth at large enrollment of physically-handicapped children in special education classes will continue to increase during the next decade in direct proportion to the provision of such facilities.

Enrollment in Kindergarten Classes - Records as to kindergarten enrollment are not available for the entire Commonwealth. As indicative of state-wide demand, data as to this type of public education have been drawn from Philadelphia and Pittsburgh exclusively, which cities now enroll over 50 per cent of the total State registration in kindergartens.

The curve of kindergarten enrollment shows a rather gradual increase from 16,000 in 1924 to 19,000 in 1930, followed by a decrease during the following year suggesting the influence of our falling birth rate.

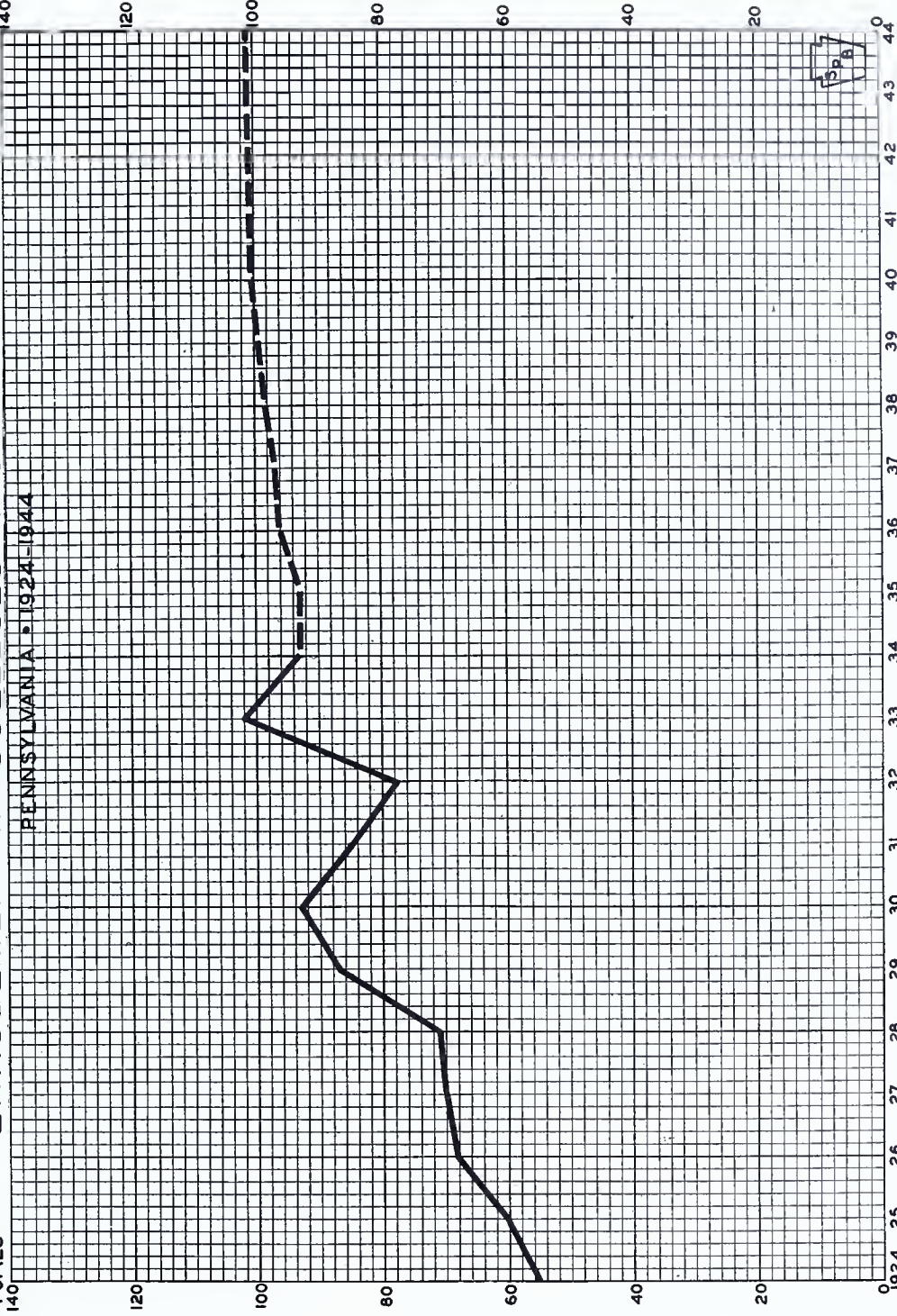
Total Enrollment in Continuation Schools - Total enrollment in

ENROLLMENT IN COLLEGES & UNIVERSITIES

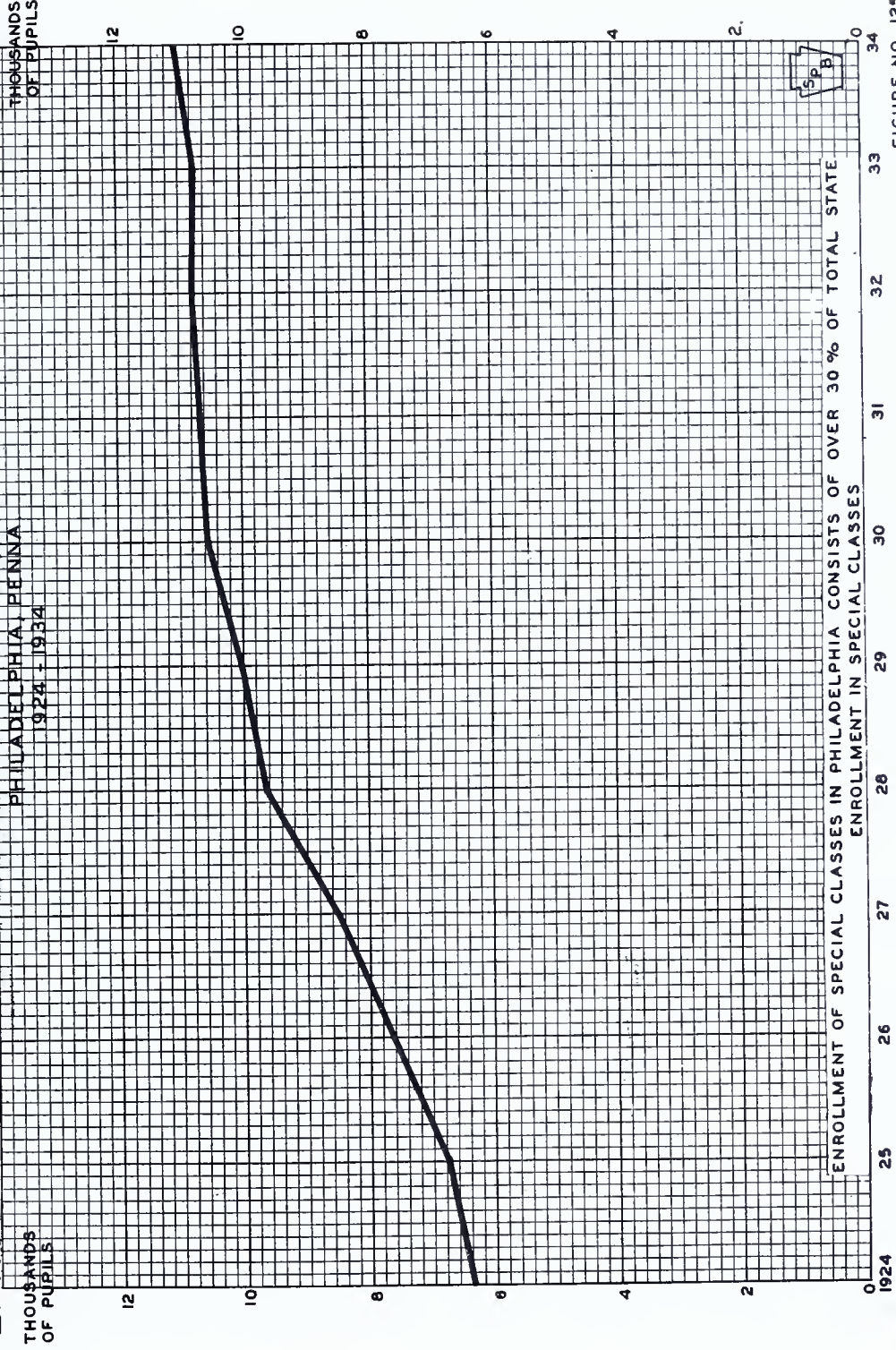
THOUSANDS OF PUPILS

THOUSANDS OF PUPILS.

PENNSYLVANIA • 1924-1944

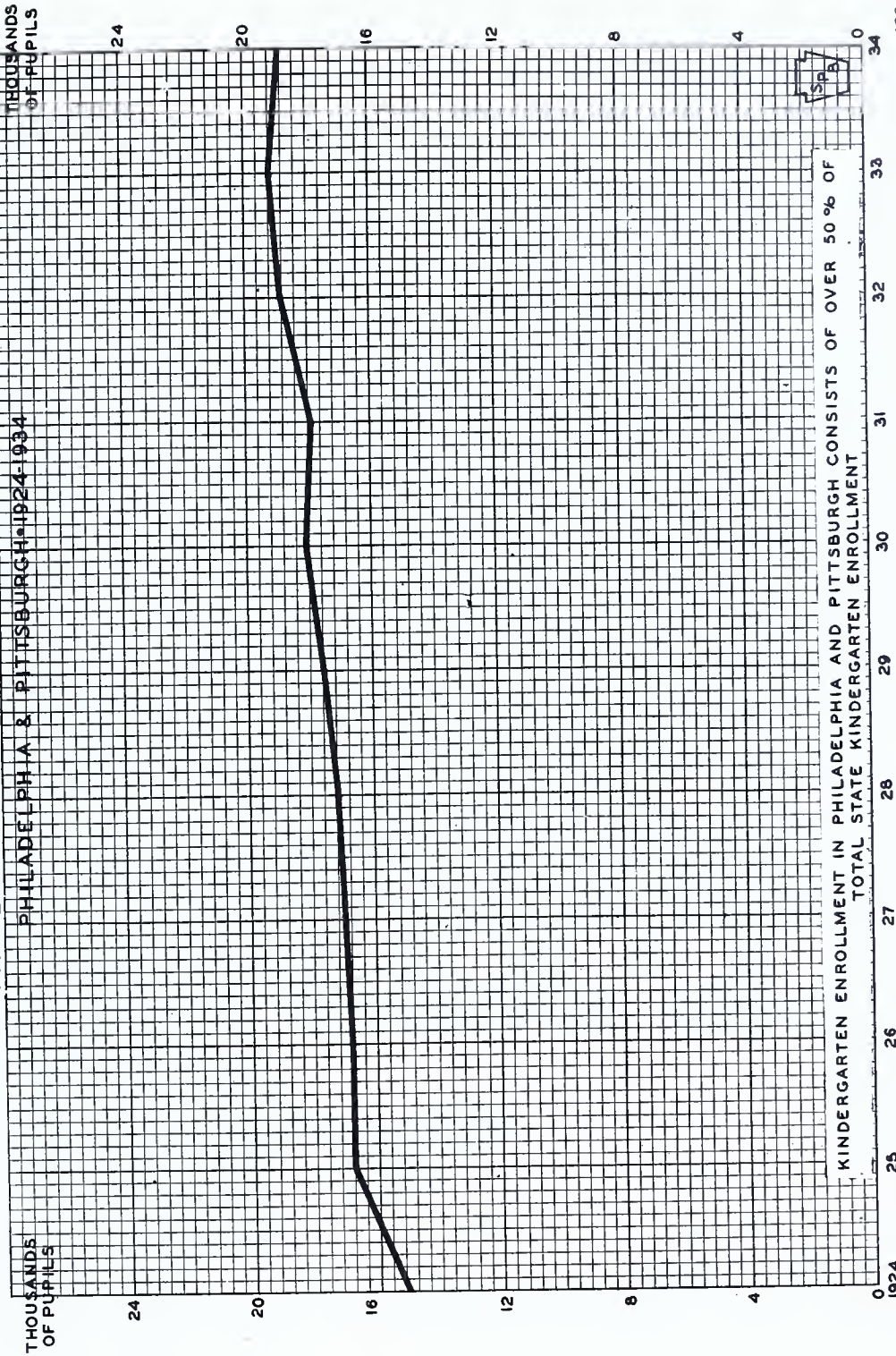


ENROLLMENT OF HANDICAPPED CHILDREN IN SPECIAL CLASSES





KINDERGARTEN ENROLLMENT





continuation schools for the period 1924-1934 is shown in another chart. Continuation school pupils are those of that group of employed minors between fourteen and sixteen years of age, who, under the provisions of the Child Labor Act, are given work permits but required to attend school for eight hours each week, constituting an exception to the State compulsory attendance laws.

The actual curve of continuation school enrollment shows a total continuation school enrollment for the Commonwealth of 49,000 in 1924 and a relatively constant enrollment to 1930, followed by a rapid and steady decrease to 6,000 in 1934. In view of prevailing unemployment and the economic stress of the past five years, this rapid decrease in continuation school enrollment is a natural result. Pupils constituting the larger enrollment prior to 1930 have reached the upper age limit of the compulsory school attendance law and they have not been replaced because of continued attendance of this class of pupil due probably to inability to secure employment.

Total Enrollment in Workers' Education - (Being studied - to be reported later).

The Youth Problem in Pennsylvania - Outstanding among the educational problems of Pennsylvania is that of our youth. Public school records for 1934 show that during that year, in Grades 9-12, 326,000 pupils were enrolled. The total enrollment in public secondary education for the school year 1929-1930 was 296,372. The Federal Census of 1930 reported a total of

663,221 children of teen age in Pennsylvania who were not in any school whatever.

The total number of high school graduates in 1933 was 64,533, while the number of college entrants for that year was 16,558. Including 1930, we have since graduated a total of 288,000 girls and boys from our high schools, and during the same period fewer than 20,000 have entered institutions of higher learning.

The public schools have made an effort to provide occupation for our army of idle youth by means of post-graduate courses, but the maximum number of these at any given time, slightly exceeding 6,000, was enrolled in 1933. Confronted by prevailing unemployment and a severe economic depression, the youth of Pennsylvania, for the greater part, can neither go on to college nor find jobs.

The influence of rapidly growing leisure on this large group of the young manhood and womanhood of Pennsylvania, with the social and economic significance of continued enforced idleness during formative years, is a problem which should challenge the interest and aggressive attention of parents and citizens.

CURRICULA AND METHODS OF TEACHING

Definite and constant trends in curriculum making and in methods of teaching during recent years, promise a continued development along rather well established lines.

CONTINUATION SCHOOL ENROLLMENT

THOUSANDS OF PUPILS

THOUSANDS OF PUPILS

PENNSYLVANIA - 1924 - 1934

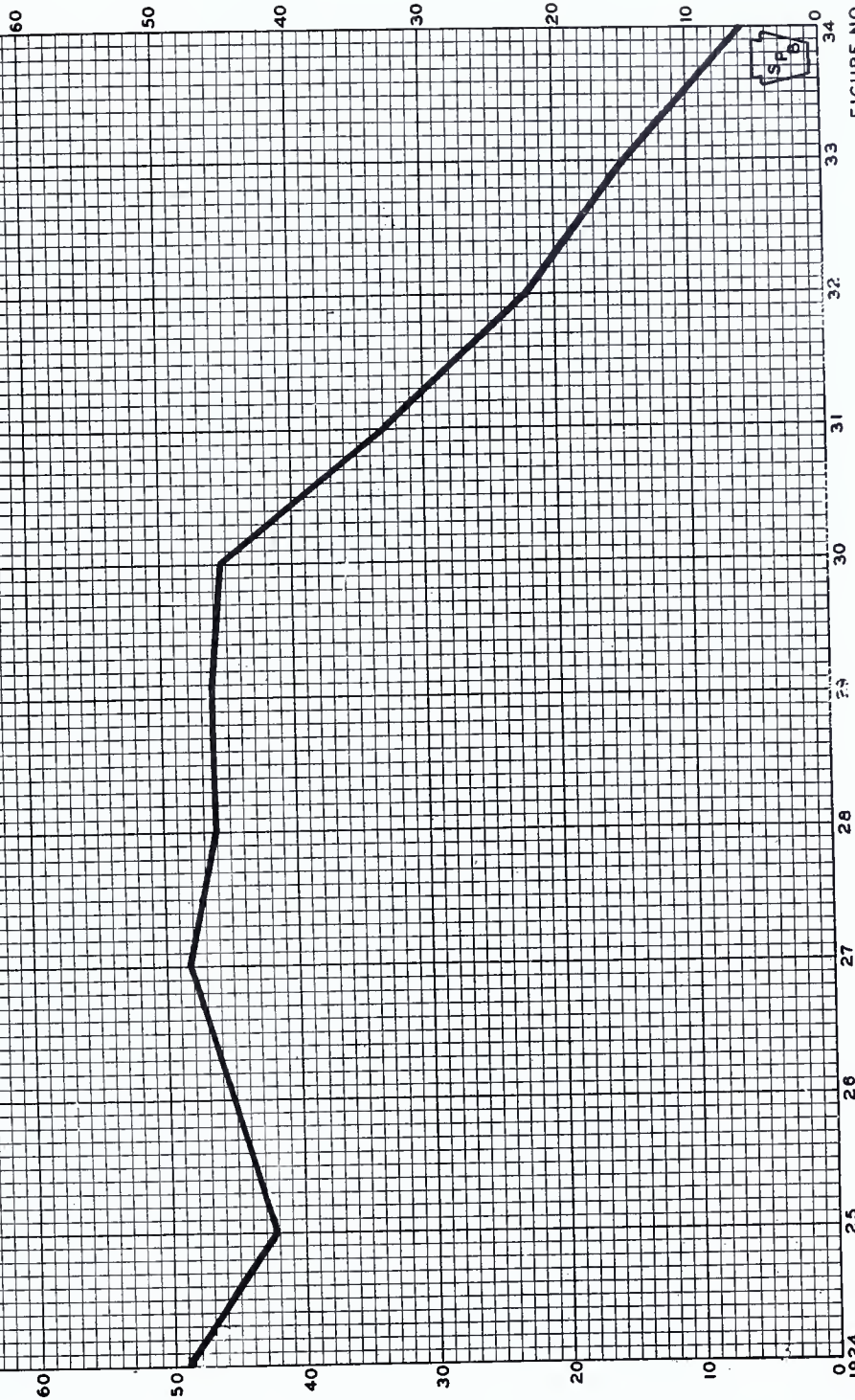
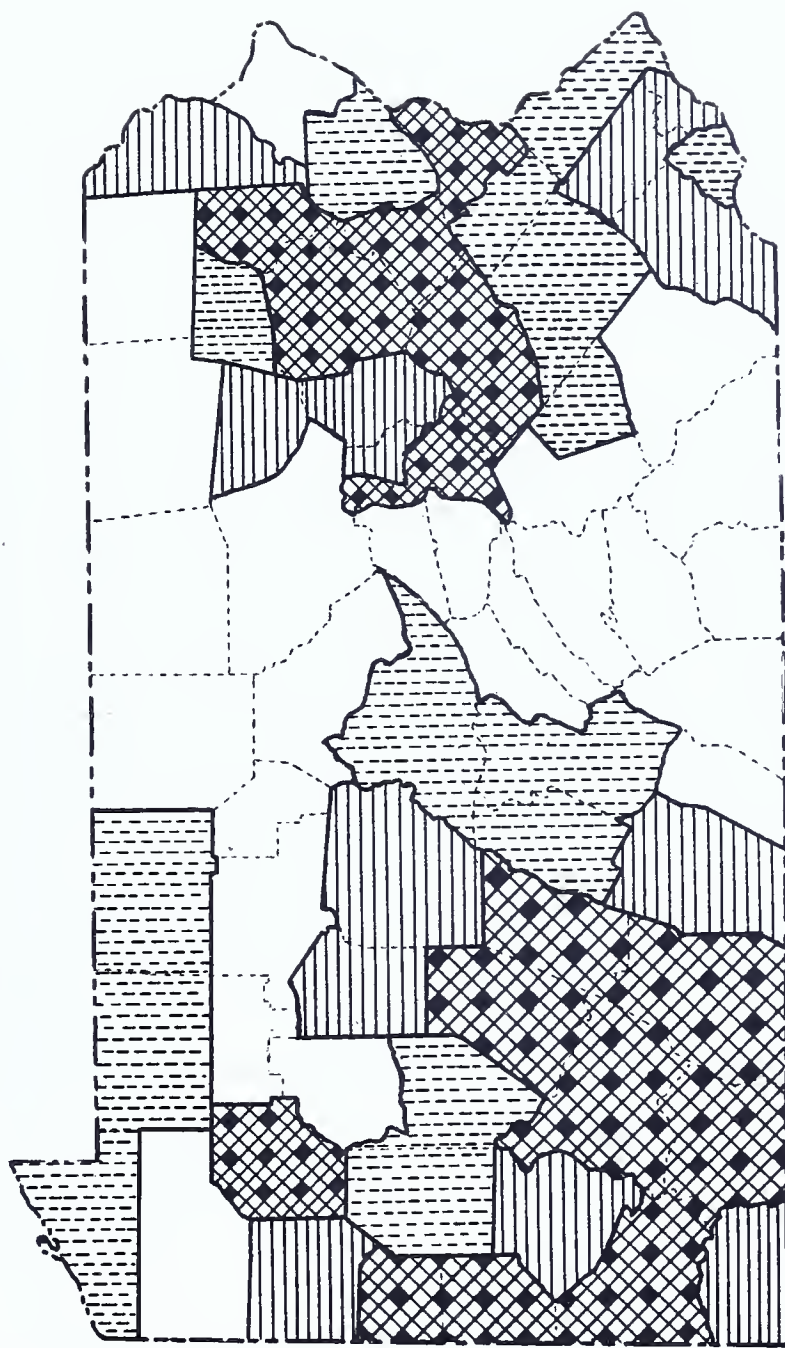


FIGURE NO. 127

PERCENTAGE OF ILLITERACY

PENNSYLVANIA • 1932.



PENNA. DEPARTMENT OF PUBLIC INSTRUCTION



FIGURE NO. 128



Curricula - Curriculum making for three decades past has been characterized by a differentiation of courses in an effort to meet individual needs. During this period the junior high school, offering a wide choice of subjects and exploring the interests and aptitudes of pupils, has shown a rapid growth. Commercial education, industrial education, home economics, agricultural education, and the fine arts have been given a large and significant place in the program of public school offerings.

So, also, the integration of subject matter under generalized themes, in elementary and secondary grades, is effecting a consciousness in children of the interdependence of all mankind. Progressive-education schools now dispense with reading, writing, spelling, arithmetic, grammar, drawing, and construction classes as such, but in one general theme such as "the ship" will employ in a well-coordinated theme all of these fields of subject matter in a practical and effective use of life situations. In high school work general history, general science, general mathematics, and unified English have sprung directly from the integration movement.

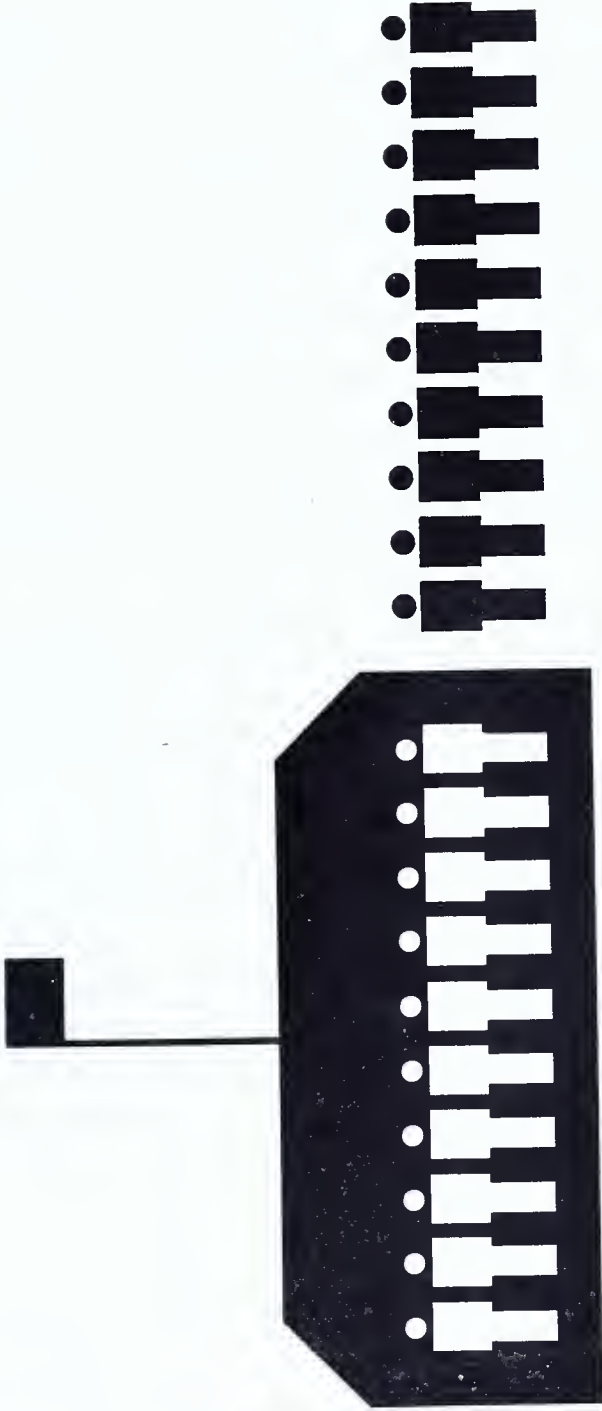
Methods of Teaching - The traditional group-recitation plan based upon a crude classification of pupils as to their ages and abilities and at its worst consisting of its much-deplored "pouring-in" process, is rapidly giving way to a policy of direction of learning.

The socialized recitation, in which a member of the class

takes charge, with the teacher in the background, and as chairman conducts a general informal group discussion of the lesson assignment, has been found to eliminate the restrictions and inhibitions of the formal recitation. This plan stimulates independent thought, increases participation, develops the ability to compare facts, to discriminate, and to come to conclusions. Its outstanding disadvantage, however, is that all members of the class, regardless of ability, must proceed over identical course content regardless of their interests and needs, and at a rate of speed uniform for all.

Individualized directed study as a general method constitutes the other major line of divergence in methods and provides organized subject matter in units of work outlined in the form of master sheets for the general direction of pupils in their study. This plan has the advantage of throwing each pupil on his own resources except as he seeks help from his instructor. It trains him in finding the information he needs and in utilizing it to the desired ends. It permits each pupil to work at maximum capacity developing application and industry and enables him to progress as rapidly as possible. It, too, develops initiative, independence of thought and judgment, but it does not provide the wealth of social relationships nor the free exchange of thought and judgment possible in group work.

Mention should be made of the rapidly growing use of sensory aids as a basis for learning. Recent realization



HALF OF YOUTH (14 TO 19)
IS NOT IN ANY SCHOOL

experience has fixed the fact that in this age of books neither spoken nor printed word can have meaning except as the individual possesses some previous experience which will serve as a basis for understanding its meaning. This has led to the setting up of experience as one of the fundamental objectives of education. The major objectives of elementary education are now recognized as being a reasonable mastery of the tools of learning plus a broad experiential foundation. Consequently a greatly enlarged use of objects, specimens, models, graphs, the school journey, and pictorial and musical reproductions will characterize the future methods and techniques of teaching.

Generally speaking, great strides will be made during the next decade in socializing both curriculum content and methods of teaching. More and more they will tend to draw from immediate environment the subject matter of course content, and increasingly they will duplicate natural living conditions as learning situations, developing in individuals qualities which will equip them for successful participation in community life and for making intelligent contributions to society.

TEACHER PREPARATION

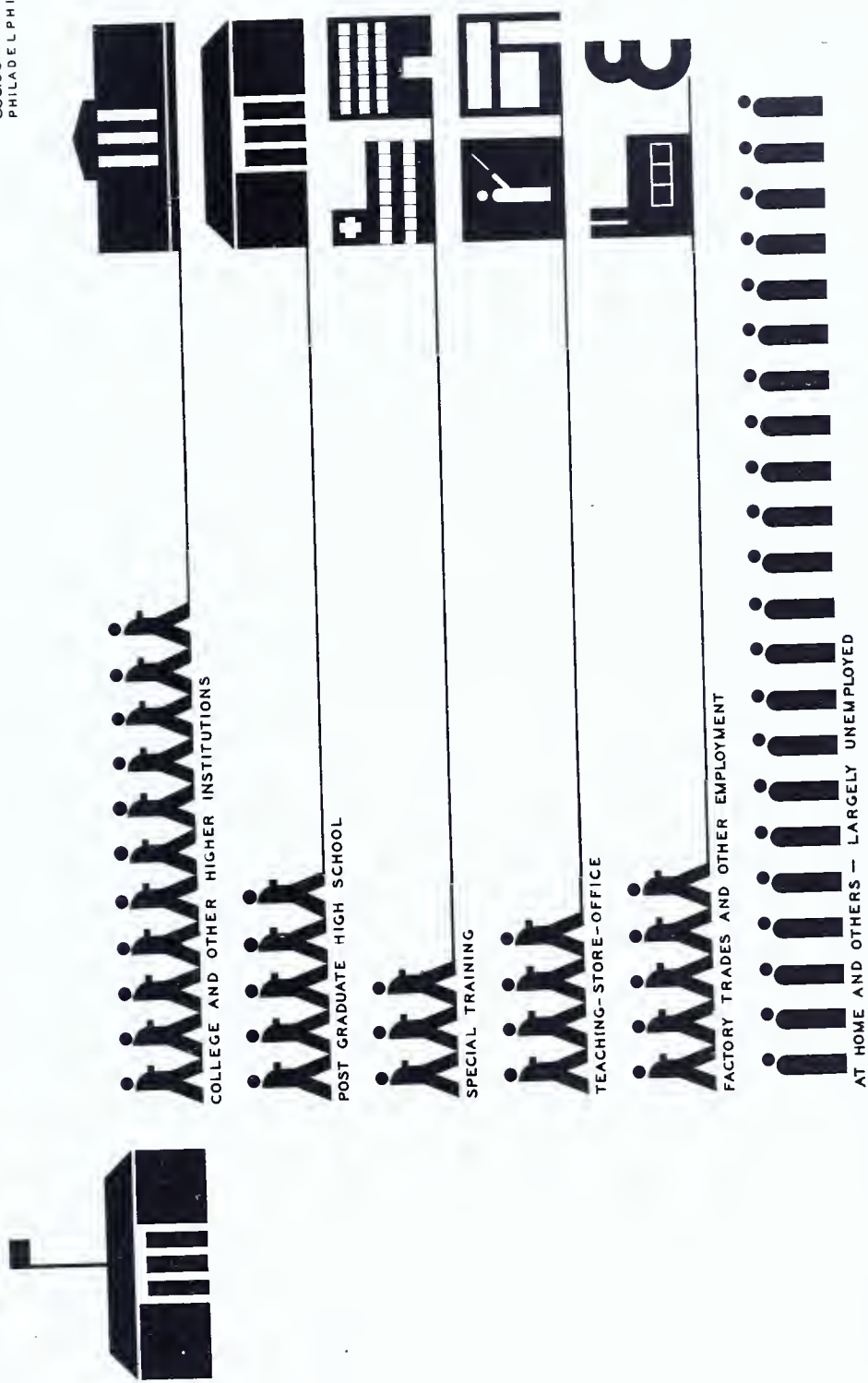
The function of preparing teachers for the public schools of Pennsylvania is now served primarily by thirteen state-owned Teachers Colleges and the Cheyney Training School for Teachers and fifty other approved institutions of higher learning within the Commonwealth. In 1934, the Teacher Colleges graduated 2,636 well-trained prospective teachers from a total enrollment of 8,549 students.

Current Administrative Policies and Practices - Recent trends in teacher preparation are characterized by steadily rising standards in the qualifications for faculty membership, in course content, and in achievement required of students. Practically all teacher-preparation institutions require of faculty members a minimum training represented by the master's degree and at least three years of teaching experience in the public schools.

Advanced entrance requirements, recently adopted, have insured in new teachers college entrants both proper personality and character traits and a requisite educational background which have improved perceptibly the quality of the student body.

The adoption of a graduated four-year, preparation-level program for all teachers will eventually bring minimum requirements for elementary school teachers abreast of those now required for high school certification.

It is significant that even in fourth class districts, employing approximately 28,000 teachers, 28 per cent of these are



WHAT HAPPENS TO HIGH
SCHOOL GRADUATES

now college graduates and 98 per cent have had two years or more of special training, whereas in 1930 but 92 per cent had two years or more of such training.

In recent years a general distribution among state teachers colleges of responsibility for teacher preparation in special subjects and fields, has been supplanted by specialization in certain institutions, of training for teaching in such fields. At this time we have three state teachers colleges maintaining specialized courses of teacher training in art, three institutions do likewise in music, two in commercial education, three in health education, two in library, two in home economics, and one in kindergarten education.

In-service training of teachers is carried on by means of summer schools, extension courses, institutes, and Saturday-afternoon classes.

Future developments in teacher preparation will be influenced by the trend away from specialization and toward generalization in keeping with the modern conception of learning. For the same reason, equally broad training will be required for elementary and secondary certification. Higher standards of mental, spiritual, and physical fitness will be required of those registering for teacher training and, in keeping with the integration movement and trends in our changing concept of education, our present narrowed specialization will probably give way gradually to a broader and more diversified educational background as a fundamental requirement for certification.

Teacher Supply and Demand - In a report made in 1932 by the Committee on Teacher Preparation of the Commission for the Study of Educational Problems, evidence was submitted showing that the annual turn-over of teaching personnel required annually the certification of 5,500 to 7,000 new teachers. While some excess of supply of trained teachers over demand was at that time apparent, it was shown that this excess was due largely to a preponderance of secondary school teachers.

While making no specific recommendations as to the number of required teachers, it pointed out that the current enrollment of students in state teachers colleges was generally in harmony with the determined annual demand for new teachers, and that whatever excess of teachers existed over the demand, this represented a wholesome condition allowing for selective processes in the appointment of teachers, which should be constantly operative.

Recommendations of the Committee on Teacher Preparation - The following constitute in brief the recommendations of the committee on teacher preparation of the Commission for the study of educational problems in Pennsylvania:

I. Recommendations as to qualifications of teachers and the salary schedule.

1. The minimum standards for admission of students to approved teacher-preparation curriculums in approved teacher-preparation institutions should be the same for all such curriculums.

2. Required qualifications for certification should be uniform for all teachers irrespective of the age levels of children taught, of the different subjects taught, and of the different classes of school districts in which teaching is done.
3. The minimum salary schedule should be uniform for all teachers irrespective of the age levels of children taught, and of the different subjects taught, and of the different classes of school districts in which teaching is done.
4. That the present minimum salary schedule of teachers be changed to provide smaller annual increments over a longer period of service tending to stimulate self-improvement of teachers after appointment, and providing a suitable reward for faithful service.

II. Further recommendations regarding minimum standards for the approval of teacher preparation institutions were submitted covering the following items:

Demonstration of need for additional facilities for the preparation of teachers, uniform admission requirements for all teacher preparation institutions, adequate curricula, a minimum faculty personnel, adequate training school facilities, appropriate dormitory facilities, a sufficient budget, and minimum library, laboratory, and gymnasium facilities.

LOCAL SCHOOL ADMINISTRATION

Pennsylvania's present school district system may be shown somewhat in detail by the following tables:

Classification of School Districts by Population and Number of School Districts, 1932-33*

Class of District	Total Population	Number of School Districts
First	500,000 or more	2
Second	30,000 but less than 500,000	20
Third	5,000 but less than 30,000	259
Fourth	less than 5,000	2,304

* Statistical Research Studies, number 9, Department of Public Instruction.

Number of Teachers and Pupils Per Director by Class of District, 1932-1933*

Class of District	Number of Directors	Number of Teachers	Number of Teachers Per Director	Number of Pupils	Number of Pupils Per Director
First	30	11,805	394	422,407	14,080
Second	180	8,681	48	265,094	1,473
Third	1,813	18,918	10	618,056	341
Fourth	11,520	23,481	2	722,884	63

* Statistical Research Studies, number 9, Department of Public Instruction.

From the first of the two foregoing tables it is apparent that of a total of 2,585 school districts within the Commonwealth 2,304 have a total population of less than 5,000 people each. Of the latter, 34 school districts maintained no schools and employed no teachers, transporting resident children to adjoining school districts. The smallest school district in Pennsylvania that conducted schools had an average daily attendance of 10 pupils during the school year 1932-1933 and a total population according to the United States census of 1930 of 33 persons. One-half of all the school districts in the Commonwealth had an average daily attendance of less than 245 pupils per district. The census shows that 1,200 school districts had a population of less than 1,000 per district.

The second table shows that in all fourth-class districts the average number of pupils per director was 63, and the average number of teachers per director was 2. During this year (1932-1933) there were 631 school districts each of which employed fewer teachers than they had school directors.

A compilation of areas of the school districts of the Commonwealth shows the average school district of the Commonwealth to be a theoretical square only slightly in excess of four miles on each side.

Records for the school year 1932-1933 show a total of 6,105 one-room schools within the Commonwealth. 798 consolidation schools, tending toward elimination of one-room schools and the creation of larger local units of school administration,

enrolled last year approximately 190,000 pupils.

Teachers and Average Daily Attendance by School Districts - The following tables indicate the inadequacy for school purposes of the present school district system of the Commonwealth:

Teachers by School Districts, 1932-1933

Number of Teachers	Number of Districts	Per Cent
<u>Total 2,585</u>		
0	34	1.3
1	118	4.6
2	163	6.3
3	141	5.4
4	175	6.8
5	180	7.0
6	183	7.1
7	152	5.9
8	156	6.0
9	132	5.1
10	102	3.9
Over 10	1,049	40.6

The above table shows that 34 school districts maintained no schools and 1,536 school districts have 10 teachers or less. 1,424 school districts, or 55 per cent, have no high schools.

Number of School Districts by Average Daily Attendance

Average Daily Attendance	Number of Districts	
	Total	<u>2,383</u>
0-24		95
25-49		151
50-99		296
100-199		607
200-299		416
300-399		218
400-499		147
500-999		334
1000-1499		<u>119</u>



CHILDREN GO FARTHER TO SCHOOL
BUT GET MORE

This table shows that 542 school districts have an average daily attendance of less than 100 pupils and that 2,383 school districts have an average daily attendance of less than 1,500 pupils. 10 high school teachers represent an approximate minimum as a faculty for offering a program of high school education with a reasonable choice of courses in accordance with pupils' interests and needs, but such a high school of 275 pupils is representative of a school district having a population of at least 5,000 and an elementary school enrollment of at least 800 pupils, and a total school enrollment of over 1,000. From the above table it is obvious that of our 2,585 school districts, 2,264, or more than 87 per cent are too small to maintain a high school program with reasonably fair offerings with some degree of economy.

Of the 2,031,441 pupils reported as enrolled in the school year 1932-1933 only 70,734 were classified as non-resident or tuition pupils. For the school year 1929-1930 the total secondary school enrollment was 296,372. The Federal census reporting for that year a total of 663,221 children of teen age in Pennsylvania who were not in any school whatever suggesting the influence of our present small local school district upon high school enrollment and presenting an apparent lack of equalized educational opportunities.

Unequal Educational Opportunities - Due largely to the smallness of local units of school administration there is a prevailing lack of educational opportunities for our girls and boys through-

out the greater part of the Commonwealth. To recognize this one needs only to compare our total number of school districts, (2,585) with the number of school districts actually offering a choice of educational opportunities as indicated in the following:

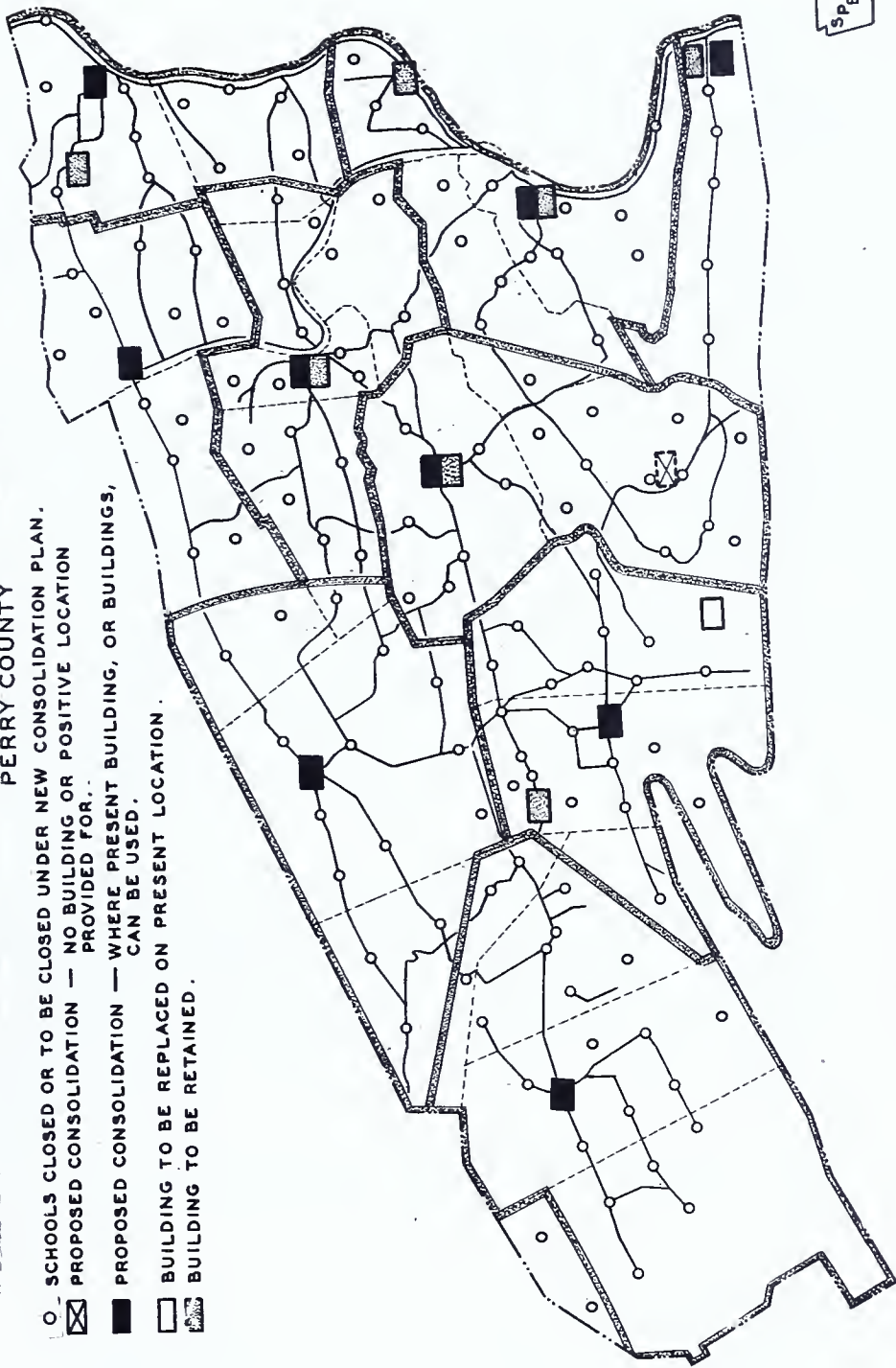
Four-Year High School	- 948 School districts
Commercial Education	- 430 school districts
Vocational Education	- 291 school districts
Agricultural Education	- 115 school districts
Home Economics Education	- 172 school districts
Industrial Education	- 150 school districts
Industrial Arts Education	- 347 school districts
Special Education Classes	- 87 school districts
Evening Schools	- 63 school districts
Evening High Schools	- 24 school districts

The present school district system is for the greater part a continuation of the original political districting plan created for the Commonwealth more than 100 years ago. Despite the rapid improvement during the past three decades of transportation facilities, Pennsylvania continues to ignore these advantages and the growing educational demands of this day and age. The automobile and the improved roads with transportation of pupils have reduced distance to at least one-fourth. Today children can go farther in the same length of time and get more.

General Recommendations as to School Administration - The following summarizes briefly the proposals as to school administration arising from the recommendations and deliberations of the Committee on Local Unit of School Administration, the Executive Committee of the Commission for the Study of Educa-

PROPOSED CONSOLIDATION OF SCHOOL DISTRICTS PERRY COUNTY

- O SCHOOLS CLOSED OR TO BE CLOSED UNDER NEW CONSOLIDATION PLAN.
- ☒ PROPOSED CONSOLIDATION — NO BUILDING OR POSITIVE LOCATION PROVIDED FOR.
- PROPOSED CONSOLIDATION — WHERE PRESENT BUILDING, OR BUILDINGS, CAN BE USED.
- BUILDING TO BE REPLACED ON PRESENT LOCATION.
- ▣ BUILDING TO BE RETAINED.



tional Problems, and others.

1. There should be a re-organization of local school districts to provide administrative units sufficiently large to make available in an economical manner to all resident youth, educational facilities offering a complete educational opportunity throughout the elementary and secondary school levels.
2. In the creation of larger local units of school administration generally, transportation facilities and social, economic, and topographic aspects of contemplated areas should constitute the determining factors.
3. The creation of larger local units of school administration should be attended by a re-organization of all attendance areas involved in order to eliminate, as largely as possible, the duplication of effort and overhead within the unit.
4. The larger local unit of school administration should be of sufficient size and strength to provide adequately for all administrative, supervisory, and teaching functions, and should result in trained leadership, increased local initiative and responsibility, and further decentralization of authority.
5. Convenience in the administration of larger local school districts will be enhanced by adherence to civic boundary lines or election precinct lines, but such units, if necessary in order to provide a desired school population and adequate strength or to define a natural community area, should include an entire county, or all or parts of two or more counties.
6. Economies and advantages obtained by the creation of larger local units of school administration will be furthered by the employment of the four-quarter plan.
7. The greater equalization of educational opportunity made possible by the larger local unit of school administration will be furthered by an extension in length of the day, secondary-school program with staggered assignment of teachers and pupils making the extension evening secondary school a true extension of the day secondary school.

8. The economies and advantages of the larger local unit in equalizing educational opportunity should be furthered by cooperative development, as needed, of joint projects in commercial education, industrial education, special education, parent education, post-graduate study and like public education services.
9. State responsibility for public education and State provision for financial aid, as needed, to support a minimum program of public education warrants the mandatory creation of larger school districts and required annexations necessary to an economical and effective equalization of educational opportunity for all.
10. The creation of larger local units of school administration with resulting problems of transportation of pupils, bonded indebtedness, disparity in local ability and effort, and like issues should be attended by simultaneous inauguration of the fiscal policies recommended by the committee on school finance.

SCHOOL FINANCE *

An accompanying figure shows the actual curve of public school expenditures in Pennsylvania, exclusive of capital outlay and debt service, from 1919 to 1933 inclusive. These expenditures increased steadily from approximately \$65,000,000 in 1919 to \$149,000,000 in 1932, followed by a rather sharp decrease to \$137,000,000 in 1933. The expenditures for the year ending 1932 do not include accounts payable, which totaled more than \$5,600,000. At the close of the year ending 1933 accounts payable amounted to more than \$9,000,000. Many of the accounts payable include current expense items. To avoid duplication tuition for non-resident pupils is not included in the expenditures for the years 1932 and 1933.

The average costs per pupil in average daily attendance for each year from 1919 to 1933 are presented in the following table, which shows that costs per pupil rose steadily from 1919 to 1929. From 1929 to 1932 these costs show a slight drop. The costs in 1933 compared with those of 1932 show a drop of approximately 10 per cent.

* School Finance Report prepared by D. E. Crosley, deputy superintendent in charge of the administration of finance, Department of Public Instruction.

AVERAGE COST PER PUPIL IN THE STATE'S PUBLIC SCHOOLS

School year ending	Total Expenditures for all purposes	Average cost per pupil (Total expense)	Total current expenses (excludes capital out- lay and debt service)	Average cost per pupil (current expense)
1919	\$75,343,160	\$57.41	\$65,555,008	\$49.95
1922	129,344,699	89.29	90,889,655	62.74
1926	181,392,646*	117.00*	121,640,870*	78.46*
1929	206,652,321*	128.47*	140,256,285*	87.19*
1931	208,901,253*	122.30*	148,337,459*	86.84*
1932	204,494,512*	117.83*	148,792,253*	85.73*
1933	181,609,097*	102.17*	137,039,068*	77.10*

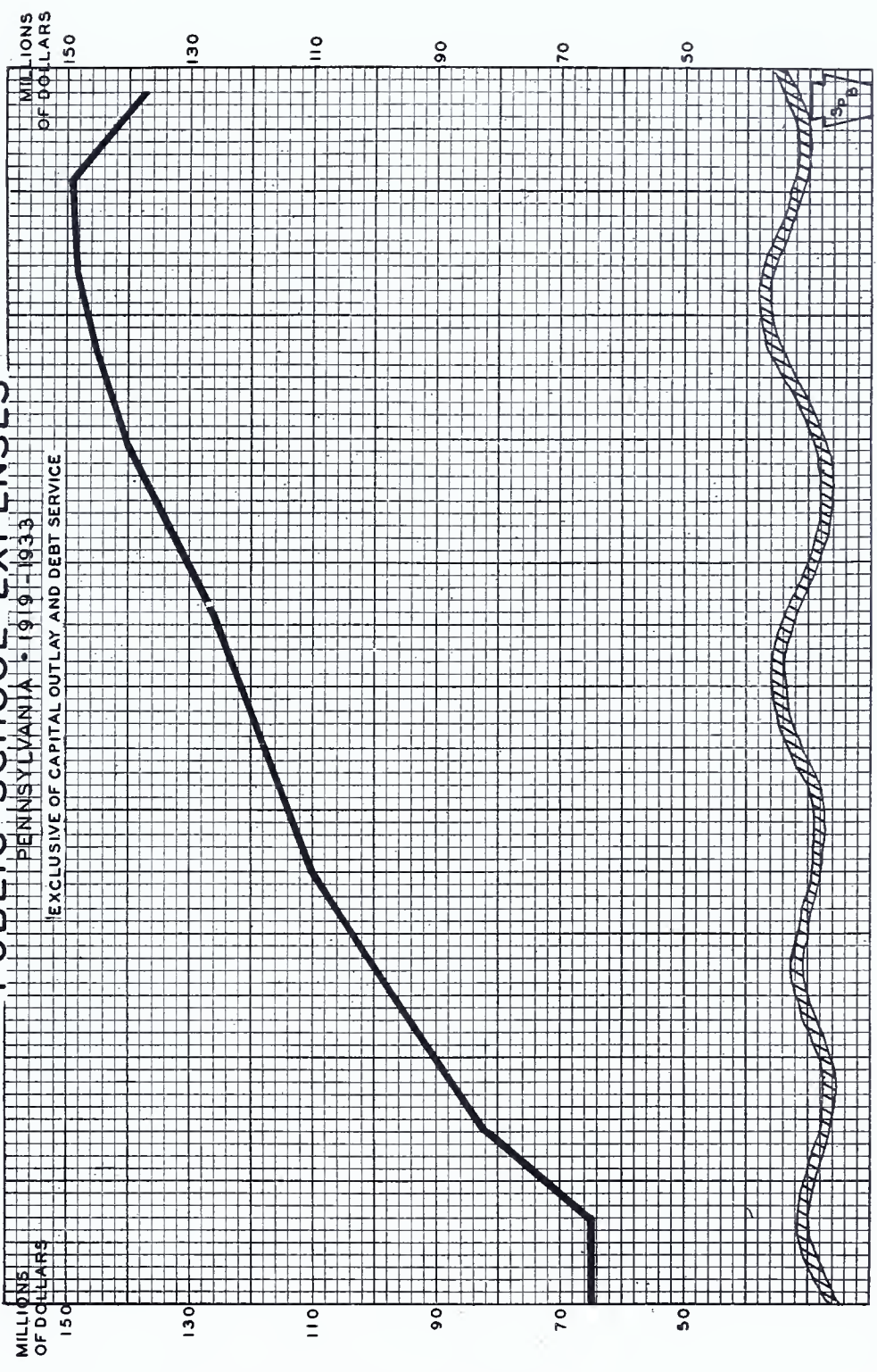
*Less tuition

In 1921 the Edmonds Act, providing for specific State appropriation to school districts maintaining salary schedules which meet minimum legal requirements, became operative. The net enrollment in the public schools increased from 1,583,187 in 1929 to 2,028,441 in 1933. The total enrollment of high schools, grades 9-12, increased from 148,240 in 1920 to 408,051 in 1933, an increase of approximately 175 per cent. The enrollment in the high schools, grades 9-12, in 1920 was 9.3 per cent of the total net enrollment and increased to 20.1 per cent of the total net enrollment in 1933. The increase of approximately 260,000 high school pupils required the addition of approximately 10,000 high school teachers, and otherwise increased the cost of maintaining schools. Growth

PUBLIC SCHOOL EXPENSES

PENNSYLVANIA - 1919 - 1933

EXCLUSIVE OF CAPITAL OUTLAY AND DEBT SERVICE



of the junior high schools, increased cost of living, better qualified teachers, enriched curricula, and improved supervision also were factors in the steady rise of expenditures.

Small School District Operating Costs

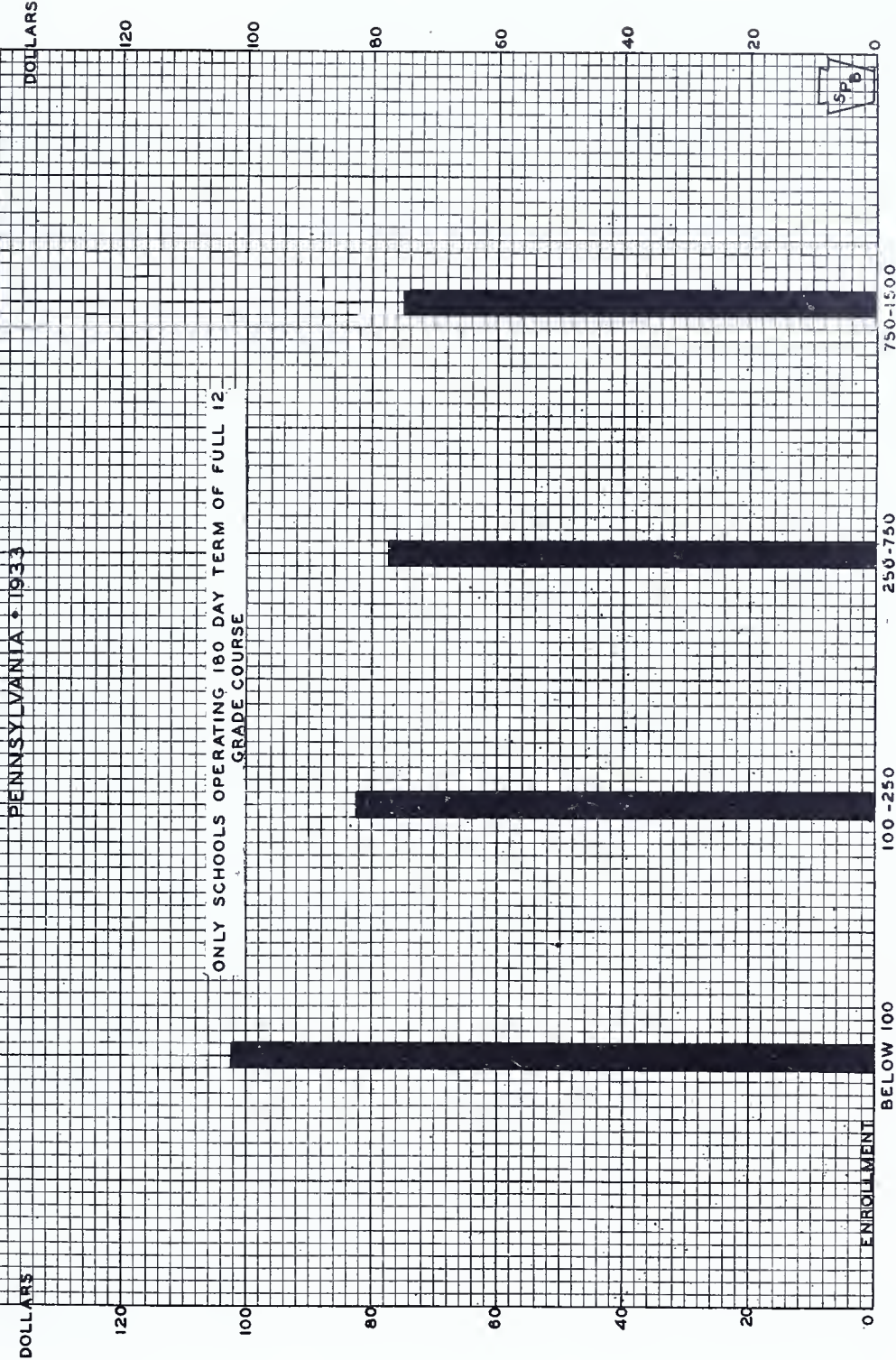
The cost of operating schools in the smaller districts has been a matter of concern for a number of years. The next table shows the median cost per pupil in average daily attendance for current expenses and instruction in districts organized as boroughs, operating elementary schools only, having elementary school terms of 160-170 days and having less than 100 pupils in average daily attendance. These costs are distributed on the basis of the number of pupils per teacher in the various school districts.

MEDIAN COST PER PUPIL IN AVERAGE DAILY ATTENDANCE FOR
CURRENT EXPENSES BASED ON AVERAGE DAILY ATTENDANCE
GROUPS FOR SCHOOL DISTRICTS MAINTAINING A TWELVE YEAR
SCHOOL PROGRAM, 1932

Average daily attendance group	Districts	Median Cost
<hr/>		
Under 100	15	\$111.67
100-199	77	77.81
200-299	117	66.17
300-399	78	64.31
400-499	67	65.91
500-999	198	67.81
1000-1999	151	72.50
2000-2999	48	75.00
3000-3999	28	80.00
4000-4999	14	76.00

The cost per pupil tends to decrease as the number of pupils per teacher increases. The median cost for current expenses in districts having 10-19 pupils per teacher is approximately twice that of districts having 35 or more pupils per teacher. The cost of instruction in the districts having 10-19 pupils per teacher is 220 per cent higher than the median cost per pupil for districts having 35 and more pupils per teacher.

RELATION OF PER PUPIL COST TO SCHOOL ENROLLMENT



MEDIAN COST PER PUPIL IN AVERAGE DAILY ATTENDANCE FOR CURRENT
EXPENSES AND INSTRUCTION IN SCHOOL DISTRICTS ORGANIZED AS
BOROUGHES, HAVING ELEMENTARY SCHOOLS ONLY, AN ELEMENTARY SCHOOL
TERM OF 160-170 DAYS, AND AN AVERAGE DAILY ATTENDANCE OF UNDER
100 PUPILS, DISTRIBUTED ON THE BASIS OF PUPIL-TEACHER RATIO,
1932

Pupil-Teacher Ratio	Districts	Median Cost	
		Current Expenses	Instruction
10-19	21	\$65.83	\$51.67
20-29	52	47.50	38.28
30-34	20	40.00	30.00
35 and over	26	33.00	23.53

The foregoing table presents the median cost per pupil in average daily attendance for current expenses for districts maintaining a twelve-year school program. This table indicates that under conditions as they were in 1932, current expenses in districts having an average daily attendance less than 100 had a higher per pupil cost than did districts having an enrollment of 10,000 to 10,999. A comparison of median costs in districts having less than 400 pupils in average daily attendance shows that costs are higher in the smaller districts. In districts having more than 400 pupils costs tend to increase because the larger districts generally provide a longer term, a more elaborate curriculum, better paid teachers and other advantages that are usually not found in the smaller districts.

Sources of State Revenue

Appropriations to the public schools are made from the State "General Fund," source of maintenance appropriations for various governmental activities and institutions.

The General Fund was accumulated during the two years beginning June 1, 1931 from taxes assessed on such items as inheritances, capital stock, insurance premiums, sales, corporate loans, mercantile and other licenses, fines and penalties, institutional revenue, and gross receipts of those engaged in transportation, generation and transmission of power, private banking, and promotion of boxing and wrestling exhibitions. Nearly one-third comes from taxes on inheritances, while the levy on capital stock raises more than one quarter. The percentage contributed by other items is relatively small in each instance.

The following table contains a record of the major appropriations by the General Assembly for the 1933-35 biennium for the operation of the public schools and the education of the deaf and the blind. (In determining the amount available for a given year, divide the appropriation by two.)

Appropriations for Public Schools
1933-1935 biennium

<u>Item</u>	<u>Amount</u>
Reimbursement to school districts on basis of teachers' salaries, etc.	\$53,000,000
Emergency appropriation for financially distressed school districts	5,000,000
Transportation	2,500,000
Education of deaf and blind	1,060,000
Salaries and expenses of county and assistant county superintendents	1,046,000
Vocational education	700,000
Miscellaneous subsidies	217,000
Training vocational teachers	90,000

The following table specifies appropriations for other educational activities:

Appropriations for Various Educational Activities
1933-1935 biennium

State aided colleges and universities	\$7,317,000
Public school employes retirement system	7,195,000
State teachers colleges	5,000,000*
Administration, salaries and expenses including examining boards	1,130,000
State-owned institutions	482,000
State-aided institutions	375,000
State Library and Museum	210,000
Former teachers	155,000
Board of Censors	130,000
Historical Commission	20,000

*In addition to the \$3,000,000, the receipts of the teachers colleges from student fees will be used in the colleges for operating expenses.

Distribution of State Appropriations

State appropriations go to the various school districts on the basis of teachers' salaries. The amount is based upon population, the true value of taxable real estate, as determined by law, and the minimum teachers' salaries as prescribed by law. Nothing in the law prohibits paying salaries greater than the minimums prescribed.

In addition to the reimbursement on the basis of minimum teachers' salaries, the State also compensates school districts for part of the cost of transportation. To promote consolidation of schools, it pays to districts of the fourth class \$200 a year for each elementary school that is closed permanently.

Thus, paradoxically, it actually pays \$900,000 a year to keep the doors of 4500 schools closed while it grants additional sums to keep schools open in financially distressed districts. In the latter instance the money is allotted during the 1933-35 biennium from a fund of \$5,000,000 appropriated by the General Assembly. A part of the high school tuition in certain districts comes from this same source.

The State also pays tuition for non-resident pupils placed in a district by order of court or by some other duly authorized child-placing agency.

When deaf or blind children are placed in a State-owned school or a school approved by the Department of Public Instruction, the State pays 75 per cent of the cost of tuition and maintenance while the local district pays 25 per cent of the cost of these items.

Minimum salaries required for county superintendents and assistant county superintendents are likewise paid by the State. They also are allowed necessary expenses for traveling. If the County School Directors' Association, which elects a county superintendent, should vote to pay him a salary greater than the minimum salary, the portion of his salary in excess of the minimum is paid out of the school fund apportioned to the school districts over which he has supervision, before the fund is distributed.

Determining the Amount of State Aid

Among the 2305 school districts of Pennsylvania with a

population of less than 5,000, the assessed valuation of real estate per teacher in one district is more than 180 times that of another district.

The State subsidy for public schools to the poorest district is only one and one-half times more than that to the wealthiest district. The wealthiest of these school districts receives from the State 50 per cent of the minimum salaries prescribed for its teachers; the poorest district receives 75 per cent.

One school district during 1933 levied no property tax but another school district had to levy a 53 mill tax.

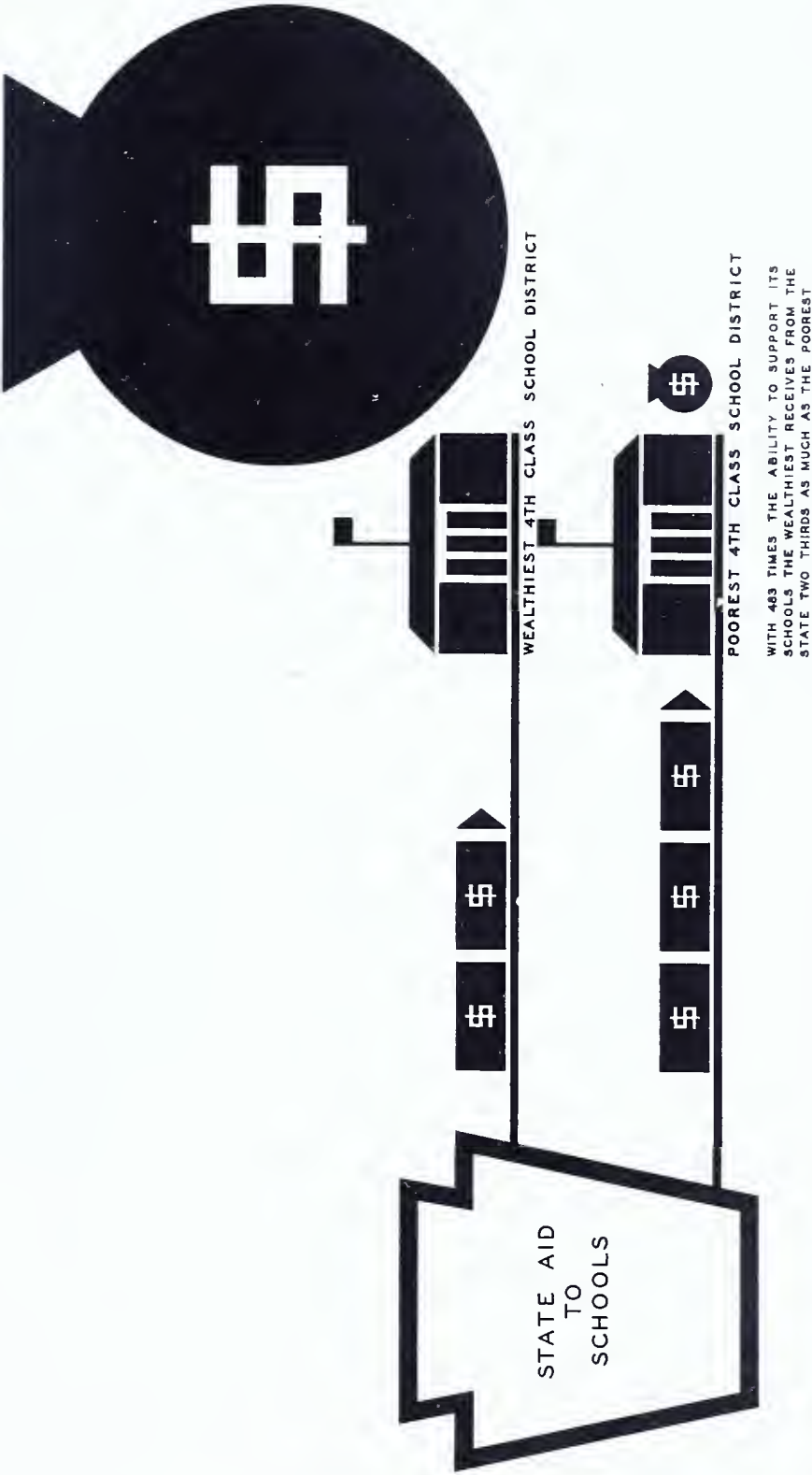
The range of difference in the amount of State aid paid to school districts is not comparable to the range of difference in their relative abilities to support public schools.

Whether the "so called true valuation" per teacher is \$5,000 or \$50,000, in all school districts where such valuation is \$50,000 or less, the State pays 75 per cent of the teachers' minimum salaries.

A five mill property tax levy in the poorest district will produce \$20 per teacher. The same tax levy in the other districts will produce \$250 per teacher.

In determining the amount of State aid due a school district under the present plan of distribution, the following three variable factors appear:

1. The assessed valuation of real estate
2. The reported rate of assessment
3. The number of teachers employed



INEQUALITY OF STATE AID



FIGURE NO. 135

Inequalities or inequities in real estate assessments are reflected in the amount of State aid paid to school districts. No responsibility has been placed on the Commonwealth relative to real estate assessments because the State levies no real estate taxes. With the increase in State subsidies to school districts and assessed valuation of real estate a factor in determining the amount of such subsidies, increasing need has developed that the State require real estate assessments on a scientific basis.

The school board secretary, although required to report the rate of assessment, usually has no accurate information upon which to base his estimate. His report is largely a matter of guess-work. The higher the guess, the more State aid for the district.

A statement from officials who have authority in connection with making assessments would have more weight than from parties who have no connection with matters of this kind.

The School Law gives the local board of school directors full authority to employ teachers. The greater the number of teachers, the greater the amount of State reimbursement for the district.

One hundred school districts qualified for a higher rate of State reimbursement for the two years beginning June 1, 1933 than for the two years beginning June 1, 1931 because of an increase in the number of teachers. In at least one-third of these districts there was no increase in the number of pupils.

In one school district the average number of pupils per teacher is nine while in another district the average is fifty-two.

Weaknesses in the plan of determining the "so called true valuation" per teacher have developed so the number of districts getting the highest rate of reimbursement has increased rapidly as indicated in the following table:

School Districts with Population
of less than 5000

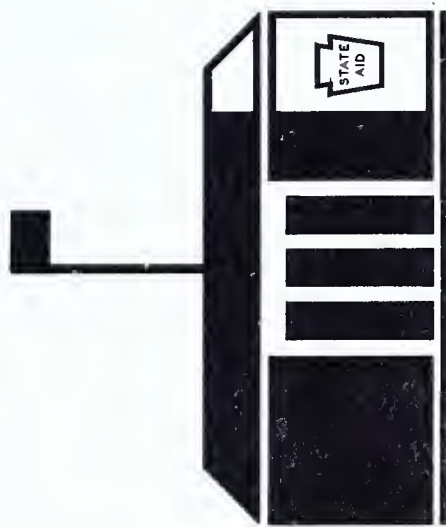
Rate of State Reimbursement	50%	60%	75%
<u>Biennium</u>	<u>Number of Districts</u>	<u>Number of Districts</u>	<u>Number of Districts</u>
1927-29	1132	876	323
1929-31	1076	873	379
1931-33	990	880	461
1933-35	854	845	593

School Districts with Population
of 5,000 but less than 50,000

	<u>35%</u>	<u>60%</u>	<u>75%</u>
1927-29	177	36	2
1929-31	165	47	3
1931-33	162	51	2
1933-35	181	66	11

FINANCIAL DISTRESS AND SPECIAL STATE AID

Owing to the excessive load carried by real estate under our tax system, a financial crisis has arisen in hundreds of our school districts. Anticipating this emergency, the General Assembly of 1931 appropriated a special aid fund of \$1,250,000 for financially distressed school districts. The General



REAL ESTATE



INTANGIBLE WEALTH



PENNSYLVANIA WEALTH

REAL ESTATE CARRIES
THE SCHOOL LOAD



PLANNING
BOARD

FIGURE NO. 136

Assembly in special session in 1933-1934 appropriated an additional special aid fund of \$5,000,000 for this purpose.

For the last half of the school year 1933-34 after this \$5,000,000 fund was made available for financially distressed school districts, 720 school boards made application for relief. Five hundred and twenty-six of the applications were approved and \$2,430,000 was allotted for the payment of overdue teachers' salaries, high school tuition and other current expenses.

A New Plan for Distributing State Appropriations

A recommendation has been made that the State assume responsibility for financing a "foundation program" of education---a guarantee of a specified length of school term and adequate standards. In order to assure this, no school district should be so impoverished that it is unable to offer something in addition to that provided by the State. To illustrate, the cost of the plan might be fixed at \$1200 for each elementary unit. If a school district were unable to meet the expense with the proceeds of a five mill tax, the State would make up the difference. If a district raised \$400 per teaching unit with a five mill tax, the State would pay such district \$800 for each teaching unit.

A teaching unit would represent a group of thirty-two elementary or twenty-eight high school pupils. Each one-room school and each special class would be considered a teaching unit. The number of pupils required for a teaching unit

GENERAL CONCLUSIONS AS TO CURRENT TRENDS

1. In view of the certain continued mechanization of industry, with resulting unemployment and leisure, and anticipating economic recovery, enrollment in schools and colleges will very probably continue to rise during the next decade above the points indicated by the projected curves submitted in this report.

2. The eventual distribution of required labor, resulting in greater leisure and a longer period of parental care for children, will tend to increase the period of school attendance for the average child.

3. The enrichment of curricula with broad differentiation of courses of study to meet individual needs will be expanded, and will be achieved, particularly in the interest of smaller high schools, by means of individualized directed study, effecting marked economies in the instructional costs of such schools.

4. The integration movement in curriculum building and directed-study trends will tend to influence teacher-preparation policies in a definite swing from recent narrowed specialization toward a broader generalization of both general and specialized training.

5. Trends in curriculum building and methods of teaching will tend to effect equivalent required preparation and a uniform minimum salary schedule for all teachers irrespective of fields of instruction, of grades or subjects taught, and of class of school district in which teaching is done.

6. A growing appreciation of the vital importance of attracting to the teaching profession the finest character and personality, the broadest culture and training, and the deepest human sympathy and understanding, will tend to increase rather than diminish the rewards given for efficient teaching service, and will tend to provide in the interest of Pennsylvania's children a constructive continuity of teaching service through suitable guarantees of tenure for those serving successfully in the capacity of teacher.

7. The principle of an equitable distribution of free public service will demand increasingly greater equalization of educational opportunity. This will come through provision for a wide differentiation and enrichment of courses and curricula of public day schools, and through the development of school extension, university extension, and library extension facilities.

8. The demand for a greater equalization of educational opportunity and the pressure for stringent economy in public school administration will tend to establish within the Commonwealth local school units sufficiently large to encompass and maintain within each of such communities the complete twelve-year program of public education.

9. The urgent need for greater efficiency in school administration will effect greater emphasis on educational counselling and vocational guidance, tending to develop a scientific analysis of common elements in individual traits and skills, and the creation of appropriate prognosis tests as a

basis for intelligently directing the pupil's choice of studies and a vocation.

10. The principle of the greatest good to the greatest number will tend to emphasize mass or integrating education for social competency rather than preparation for college entrance and leadership training, as the major objective of public schools.

11. Prevailing unrest incident to all periods of rapid social and economic change will direct attention to the vital necessity of adequate training for the intelligent and constructive participation of the individual in community, state, and national life, and will tend to emphasize the importance of a more effective assimilation of foreign-born residents, of the eradication of illiteracy, and of citizenship training as fundamental safe-guards of democracy.

12. The threat of increasing leisure to dissipate and neutralize the efforts of formal public education to develop constructively the youth of Pennsylvania, will tend more and more to impose upon educational agencies responsibility for the planning, supervision, and control of community environment and of safe recreational programs.

13. The problem of Pennsylvania's growing army of idle high school graduates and the selective-admission policy of colleges and universities, demands the development of post-high school educational facilities for high school graduates who are under-privileged or of the lower quartile brackets

by an extension of the public school program beyond the present twelve-year range, by the creation of a system of readily accessible junior colleges, or by other means.

14. The growing appreciation of the loss to society due to lack of higher educational opportunities for talented but under-privileged girls and boys, will tend to establish a system of state scholarships which will, by subsidy, provide for this group the training necessary to secure for society the contributions which they are equipped to make.

15. The gradual shift of wealth from the form of real and personal property to that of stocks, bonds, and other intangibles, resulting in a preponderance of the latter, demands a revision of the taxation system of the Commonwealth which will distribute equitably the cost of public education and establish adequate and stable sources of revenue.

16. The continued concentration of wealth in certain areas and the principle of an equitable distribution of the cost of free public service will necessitate the assumption by the Commonwealth of a much larger share of the cost of public education.

17. An equitable distribution of the local cost of public education will necessitate a state-wide system of uniform tax-assessment rates, a uniform maximum school levy if and as required to maintain the mandated foundation program of education in all school districts, supplemented by state aid if and as needed to maintain that program.

18. Financial stringency and over-crowding in public schools will tend to introduce the four-quarter plan of public education with controlled vacations of pupils, automatically increasing our present school-building capacity approximately 30 per cent.

19. Current economic stress and increasing demands for greater efficiency in administration will tend to stimulate the study of educational needs and planning, and will tend to effect the enlistment of all public educational agencies and facilities in a coordinated and more efficient program of public education for the Commonwealth.

MAJOR OBJECTIVES
CONSTITUTING
A TEN YEAR PROGRAM OF EDUCATION

1. A larger local unit of school administration.
2. Greater differentiation and enrichment of high school courses and curricula.
3. Individualized directed study and integration as the bases of teaching methods and technique.
4. Uniform required qualifications and minimum salary schedules for all public school teachers.
5. Tenure of office for public school teachers.
6. Greater equalization of educational opportunity within the limits of a mandated foundation program, for all regardless of age, economic circumstance, physical handicaps, or geographical location.
7. A scientific and enlarged program of educational counselling and vocational guidance.
8. The utilization of the four-quarter plan, with controlled vacations, to increase the capacity of school buildings.

9. Increased educational opportunities for high school graduates.
10. A more effective assimilation of foreign-born residents.
11. The eradication of illiteracy.
12. State subsidy of higher educational opportunities for talented but under-privileged high school graduates.
13. Social control through a planned program of directed recreation for Pennsylvania's youth.
14. An equitable distribution of the local cost of public schools.
15. Tax revision with uniform assessment rates and uniform maximum required school tax levies, and providing adequate and stable sources of school revenue.
16. State aid of public schools, if and as needed, based on ability to pay.
17. A more effective coordination of existing educational agencies and facilities.

Conclusion

In the foregoing, an effort has been made to indicate as briefly as possible the more urgent problems only which now confront public education in Pennsylvania, and to summarize those major objectives only upon which there is now, for the greater part, general agreement. Many related aspects of local and State school administration and finance are now in the process of being studied for inclusion in the final report.

The increased cost of transportation of pupils involved in the proposed larger local unit of school administration; the present demand for teachers in the various fields and subjects as indicated by the actual current employment of such teachers;

ways and means of effecting an equitable adjustment of the present bonded indebtedness of the different school districts which would form a larger school district; what number of pupils should constitute the proposed teaching-unit, what unit sum of State aid should constitute the proposed teaching-unit quota, and what differentiation, if any, should be made to apply to varying population and school enrollment, - these, and many other issues having a direct bearing upon the policies and provisions of State planning and development, should have careful study.

In some respects, however, present evidence is unmistakable. For the greater part, our smaller school district represents poorer school building facilities, inadequate equipment, ineffective supervision, and inefficient organization due to small school and class enrollments. Paralleling these deficiencies are higher instructional cost per pupil and corresponding losses, for which an increased State aid is allowed.

It seems obvious that the reorganization of our present system into larger local units of school administration, and a complete revision of our State aid policies are imperative. Other proposals submitted in this report are largely dependent upon these adjustments as first and basic steps. Through them Pennsylvania can secure for itself a better educational service at the same cost, or an equivalent educational service at a lower cost.

It is doubtful whether the Commonwealth can justify a continuance of its smaller local units of school administration and the consequent excessive price paid for a relatively inferior public education service.

should be sufficiently small to assure a district's having credit for supervisors and teachers of special subjects such as music, art, and vocational education. The desire to reduce the tax load on real estate is growing. Demands for additional State appropriations for education are increasing. If our children are not to be denied their constitutional right to an education, there must be a revision of our system and sources of school support.

APPENDIX

Chronological Development of Education in Pennsylvania

- 1681 - Penn's Charter provided for a committee on education "that youth may be successively trained up in virtue and useful knowledge and arts," - Permanent universal education.
- 1683 - Second Colonial Assembly provided for universal compulsory education in elementary subjects. - Compulsory education.
- 1776 - New State Constitution stated that "a school or schools shall be established in each county by the Legislature." - State responsibility for creation of educational opportunities.
- 1786 - Appropriation for Dickinson College and a provision for a fund for the endowment of public schools. - State support of public education and state aid of leadership training.
- 1802 - 1804 - 1809 - "Pauper school acts" provided a limited amount of free education for children officially labeled as paupers. - The inauguration of free public instruction for under-privileged classes.
- 1824 - First free public school act. Repealed in 1826 before being put into effect.
- 1834 - A second free public school act establishing a free public school system with the Secretary of the Commonwealth as Superintendent of Common Schools. - Inauguration of free public education for all.
- 1836 - Authority granted Philadelphia to establish a high school. - The beginning of free public high schools in Pennsylvania.
- 1838 - Law providing definite state aid to academies and colleges. - Crystallization of principle of state aid of education.

- 1849 - Teachers certificates first required; age limit of children raised from 4 to 5 years; and minimum school term increased from 3 months to 4 months. - State control of public education.
- 1854 - Act of 1854. Established school district system and county superintendencies; specified duties of school directors; and repealed provision of state aid to denominational common schools. - Further development of policies as to state responsibility and state prerogatives.
- 1857 - Provision for the establishment of state-aided Normal Schools. - Inauguration of state responsibility for teacher training.
- 1873 - Constitution of 1873. Legislative stipulation that "the General Assembly shall provide for the maintenance and support of a thorough and efficient system of public schools, wherein all the children of this Commonwealth above the age of six years, may be educated and shall appropriate at least one million dollars each year for that purpose." - Recognition of state responsibility for maintenance and support of an efficient public education system for all children.
- 1887 - Legislation regarding high schools. - Further recognition of high schools as integral part of State Program of Free Public Instruction.
- 1893 - Extension of privilege of maintaining high schools to all boroughs of five thousand or more population. - Further development of free public high school education.
- 1895 - First compulsory attendance law. - Definite inauguration of policy of required foundation program of education for all.
- 1901 - Compulsory attendance required for children from eight to sixteen years of age, with certain exceptions for thirteen to sixteen-year age group. - Increase in compulsory school age.

- 1903 - First minimum salary law. Further state control of educational interests of its children.
- 1905 - High School Act requiring districts not maintaining a high school to pay high school tuition of its pupils in another district. - Equalization of high school educational opportunity.
- 1911 - Code of 1911. Legislation regarding district organization, certification and salaries of teachers, length of school term, high school education, taxation, and other related matters. - Aggressive exercise of established state responsibilities and prerogatives.
- 1911 - Provision for the purchase of Normal Schools by the State. - Transition from partial state responsibility in teacher training to complete control of teacher-training functions and institutions.
- 1911 - Legislation exempting children having completed six grades of public school work and from fourteen to sixteen years by work permits only. - Established exception to blanket compulsory school attendance.
- 1921 - The Edmonds Act. Provided state aid for all school districts on bases of population and ability to pay contingent upon maintenance of certain minimum standards. - Further recognition of state responsibility for a mandated foundation program of education for all of its children, and acceptance of the principle of ability-to-pay.
- 1925 - Legislation regarding extension schools and the education of handicapped children making such schools and classes an integral part of the state program of free public instruction. - Established the right of all residents to the current foundation program of free public education, regardless of age, economic circumstance, physical handicaps, or geographical location, and made instruction of foreign-born residents in English and citizenship an integral part of state program of free public education.

- 1927 - Legislation permitting the use of public school buildings for the maintenance of junior colleges. - Recognized growing need for expansion of public education program.
- 1931 - Permissive legislation regarding the maintenance of kindergartens as a part of the public education program. - Recognized the interest of communities in the well-being of children below the school entrance age of six years.
- 1933 - Legislation appropriating special aid to financially distressed school districts. - Further recognition of the responsibility of the State for the maintenance of a mandated foundation program.

A PLAN FOR THE DEVELOPMENT OF PENNSYLVANIA LIBRARIES*

Even at the peak of prosperity, one-third of the citizens of Pennsylvania were without local library service. The Keystone State ranks second in population, second in wealth, second in industrial output, but occupies a much lower rank in its provision of public libraries for its people.

Careful surveys showed that 3,500,000 Pennsylvanians had no access to a public library. Twenty-three communities out of sixty-seven with 10,000 to 25,000 inhabitants, and fifty-four towns out of 103 of 5,000 to 10,000 inhabitants were without libraries. The rural districts had almost no service, and five small counties were found without a single library. In many others the only existing agencies were so small and their funds so inadequate that they were libraries in name only.

When millions of Pennsylvanians were deprived of their daily occupations by the depression, nearly a million of them turned to these struggling libraries. Some came for books which would help them prepare for a different type of work, some to advance their education, while the compelling need of diversion

*The material for this report and the points of view expressed are those of the State Planning Committee of the Pennsylvania State Library Association. This Committee consists of Miss Gertrude MacKinney, director of the State Library, Harrisburg, chairman, and the following eminent librarians: C. Seymour Thompson, University of Pennsylvania; Herbert B. Anstaett, Franklin & Marshall College; Miss M. E. Crocker, Annie Halenbake Ross Library; Professor William V. Dennis, the Pennsylvania State College; Miss Susan Himmelwright, B. F. Jones Memorial Library; Carl W. Hull, Dubois Public Library; Alfred D. Keator, Reading Public Library; Willard P. Lewis, The Pennsylvania State College; Dr. Ralph Munn, Carnegie Library of Pittsburgh; Miss Isabel McC. Turner, Allentown Free Library; Miss Florence A. Watts, Osterhout Free Library; Miss Susanne Young, Pennsylvania State Library.

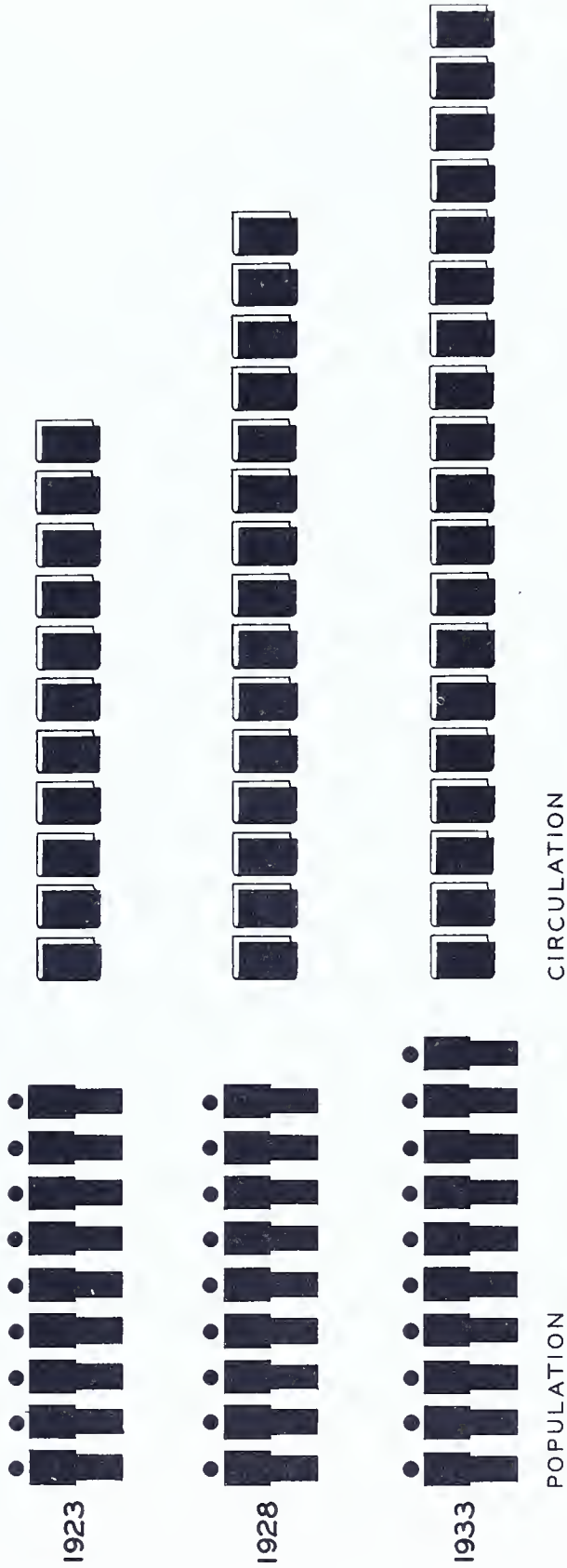
brought others.

During the period between 1929 and 1933 the number of library borrowers increased 20 per cent, and the number of books borrowed grew by 24 per cent.

In the face of this enormous growth in demand, library funds were cut an average of 23 per cent. Salaries, heat and light took most of the funds, and expenditures for books dropped to an average of six cents per year per inhabitant--the price of two or three newspapers. Unable to purchase new books, or to replace old ones as they wore out, librarians watched their collections dwindle under excessive use. Besides the depletion of book stocks, the placing of many libraries on a part-time basis of opening, and the entire closing of others, featured the depression years. Increased demand and decreased funds tell the whole story of libraries during this period.

With the present trend toward shortening hours of labor and spreading work, a greater margin of leisure is assured. Thus a continued and even increased demand for library service seems certain. Other trends which will enhance the need of the educational services of libraries are becoming known. With reduced birth rates, adults will comprise a much larger proportion of the population; with an over supply of labor, young men and women will probably enter industry at an older age and thus have more time for study and reading.

The trend of the times thus demands the diffusion of knowledge among adults and the wholesome recreational reading which



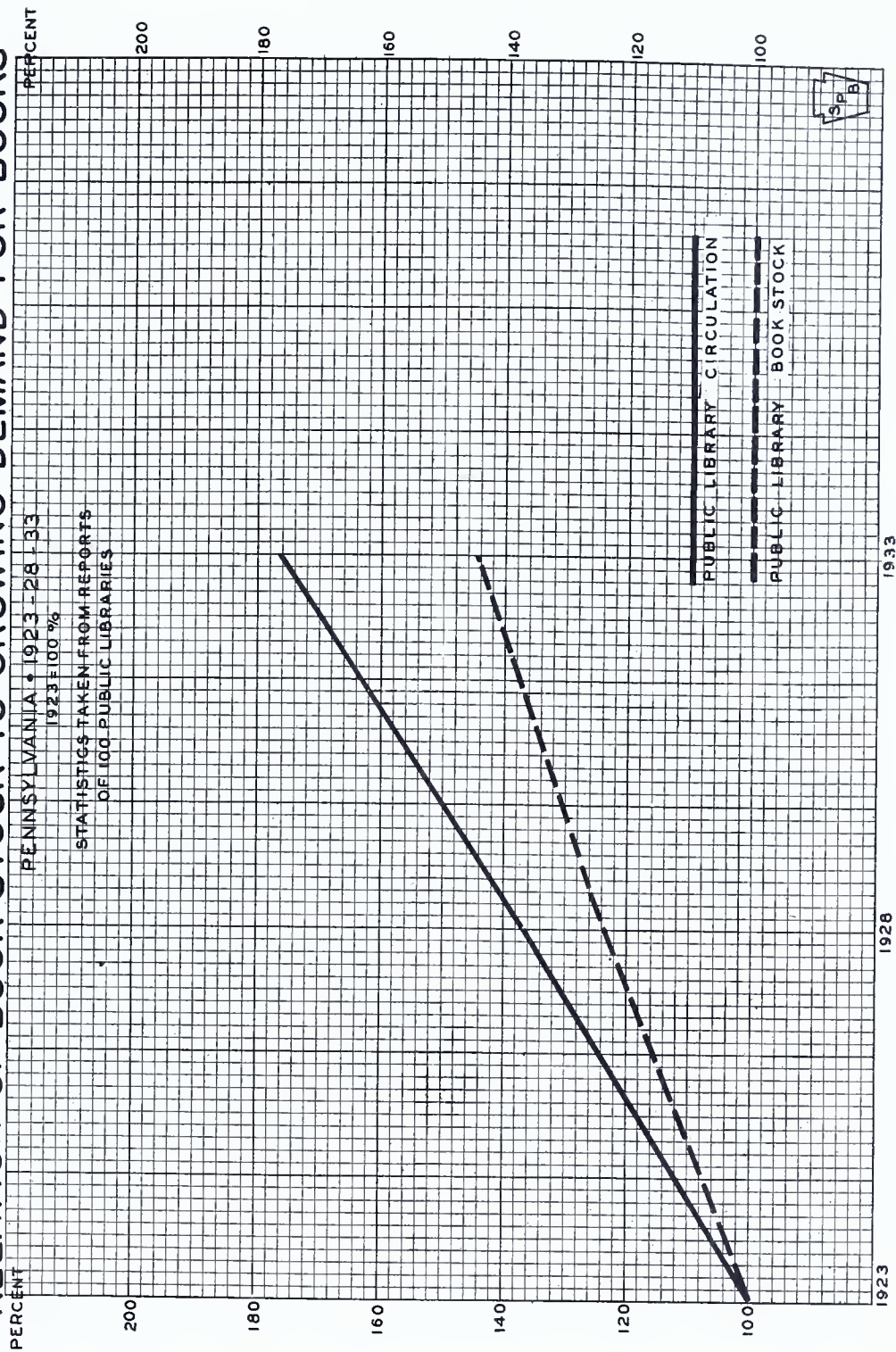
GROWTH IN HOME USE
OF PUBLIC LIBRARIES
PENNSYLVANIA

EACH FIGURE = 1 MILLION



PLANNING
BOARD
FIGURE NO. 137

RELATION OF BOOK STOCK TO GROWING DEMAND FOR BOOKS



can best be supplied by public libraries. Economy demands that library service be developed with the least possible burden upon the taxpayer. With a view to planning the future expansion of Pennsylvania's library facilities in a way which will bring both economy and efficiency, the following questions must be considered.

Practically all of our public libraries are organized for service to town units, and almost all of our larger public libraries are now controlled and financed by cities or towns. Some of the disadvantages of this system are: (a) small cities and towns have low assessed valuations and cannot raise a sufficient fund from a reasonable tax levy, (b) suburban areas are likely to use the city library without contributing to its support, and (c) the small towns and rural areas are left without service.

The organization of libraries on a county-wide basis was the first answer to these problems, but it has not been widely adopted. Although we have had a county library law since 1917, only six counties have organized libraries and none of them is given adequate support. The trend now appears to be against county governments; their elimination or the combining of counties to make larger units is advocated. Terms of endowments, charters, and local preference will probably always restrict some libraries as to their present forms of organization. Wherever possible, however, the libraries of the future should certainly be planned to serve an area which is at least larger than the city or town. Whether it be a newly designated region,

a combination of counties, or the single county, is a question which needs close study. The effort must be to find a unit of administration which is large enough to yield adequate support from a reasonable levy, yet small enough to permit localized supervision and service.

Finances are of course the crux of the whole problem. In Pennsylvania the public library's revenue comes from the general property tax as levied by municipal councils or boards of education. It is no secret that taxes upon real estate have about reached the point of diminishing returns - higher levies might result only in greater delinquency.

In 1931, Pennsylvania recognized its obligations to help in the support of public libraries when the Legislature enacted a bill giving State aid to county libraries in the less populous counties. This wise principle must be extended to give much more generous aid to all public libraries. The basis upon which State aid is given to schools, that is, in inverse ratio to the community's own ability to raise funds, is perhaps the fairest method upon which State aid can be apportioned. Any scheme of State aid should preserve to the community such freedom of action in controlling the library as will incite local interest, initiative and pride.

The Federal government's interest and support is now being extended to many activities which were formerly thought to be outside its scope. The American Library Association has asked the Federal government to recognize the inevitable inequalities in



PUBLIC LIBRARY SERVICE FOR URBAN
AND RURAL PEOPLE
PENNSYLVANIA

EACH FIGURE = 300 000 PERSONS

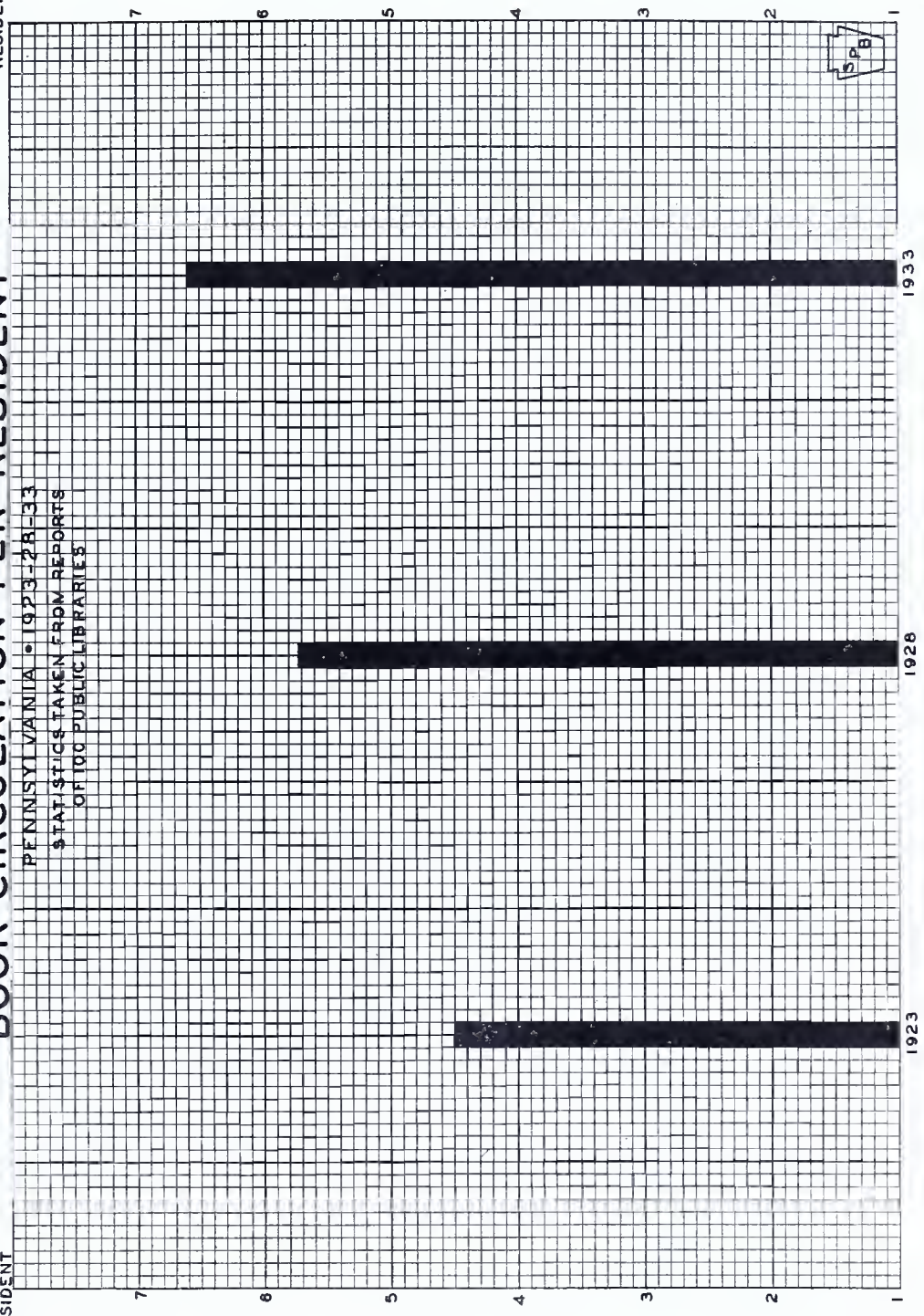


NO. OF BOOKS
A YEAR PER
RESIDENT

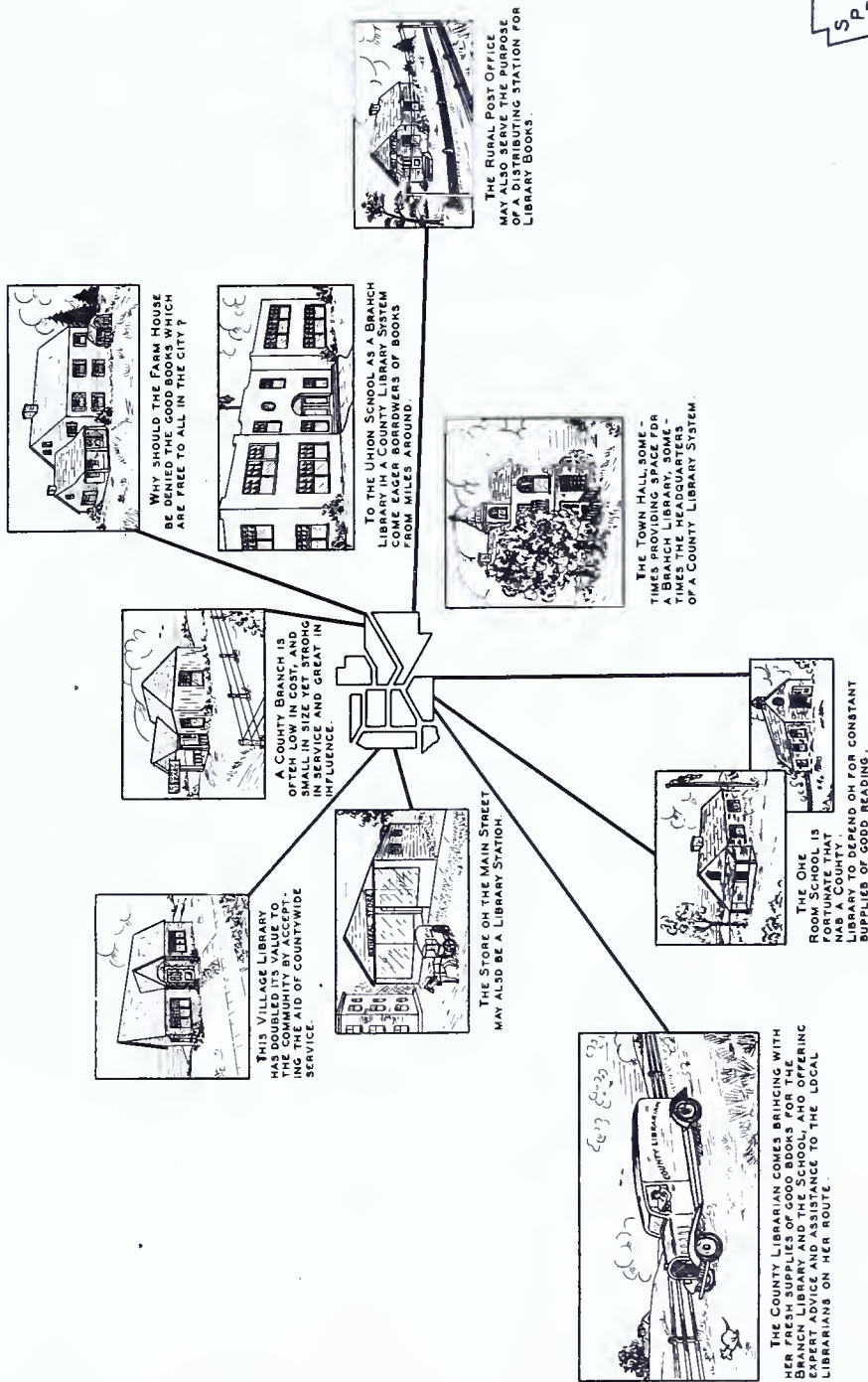
BOOK CIRCULATION PER RESIDENT

PENNSYLVANIA • 1923-28-33
STATISTICS TAKEN FROM REPORTS
OF 100 PUBLIC LIBRARIES

NO. OF BOOKS
A YEAR PER
RESIDENT



THE LIBRARY COMES HOME TO THE PEOPLE



S
P
B

library facilities in the several states, due to inequalities of taxable resources, and provide financial aid for libraries.

From all sources, local, State, and Federal, Pennsylvania libraries must be assured of an income of not less than \$1 per year per inhabitant. This amount, determined after a careful study by the American Library Association, is based upon the purchasing power of a 1930 dollar and is to be considered as a reasonable minimum.

With this income, Pennsylvania could cover the bare spots on its library map, and bring real life to the existing libraries which are unable to meet the heavy demands for service now being made.

No system of public libraries can operate successfully without a strong State Library to supplement and coordinate its services. In addition to its function as a great reference and repository library, the State Library must be prepared to aid in organizing and counselling local libraries, and acting as a clearing house for inter-library loans.

Satisfactory library service can be attained only through a well-trained professional personnel. To insure this high calibre of personal service, certification of librarians, based on education and experience, must be provided.

The libraries of our educational institutions must be included in any study of the book facilities of Pennsylvania. Provision of public school libraries is the direct responsibility of local boards of education, and for their guidance the Department of

Public Instruction has devised certain standards of operation. Efficiency and economy demand the closest cooperation between public and school libraries. Public authorities are not responsible for the development of most of our university and college libraries, but their importance as centers of research and study should be recognized.

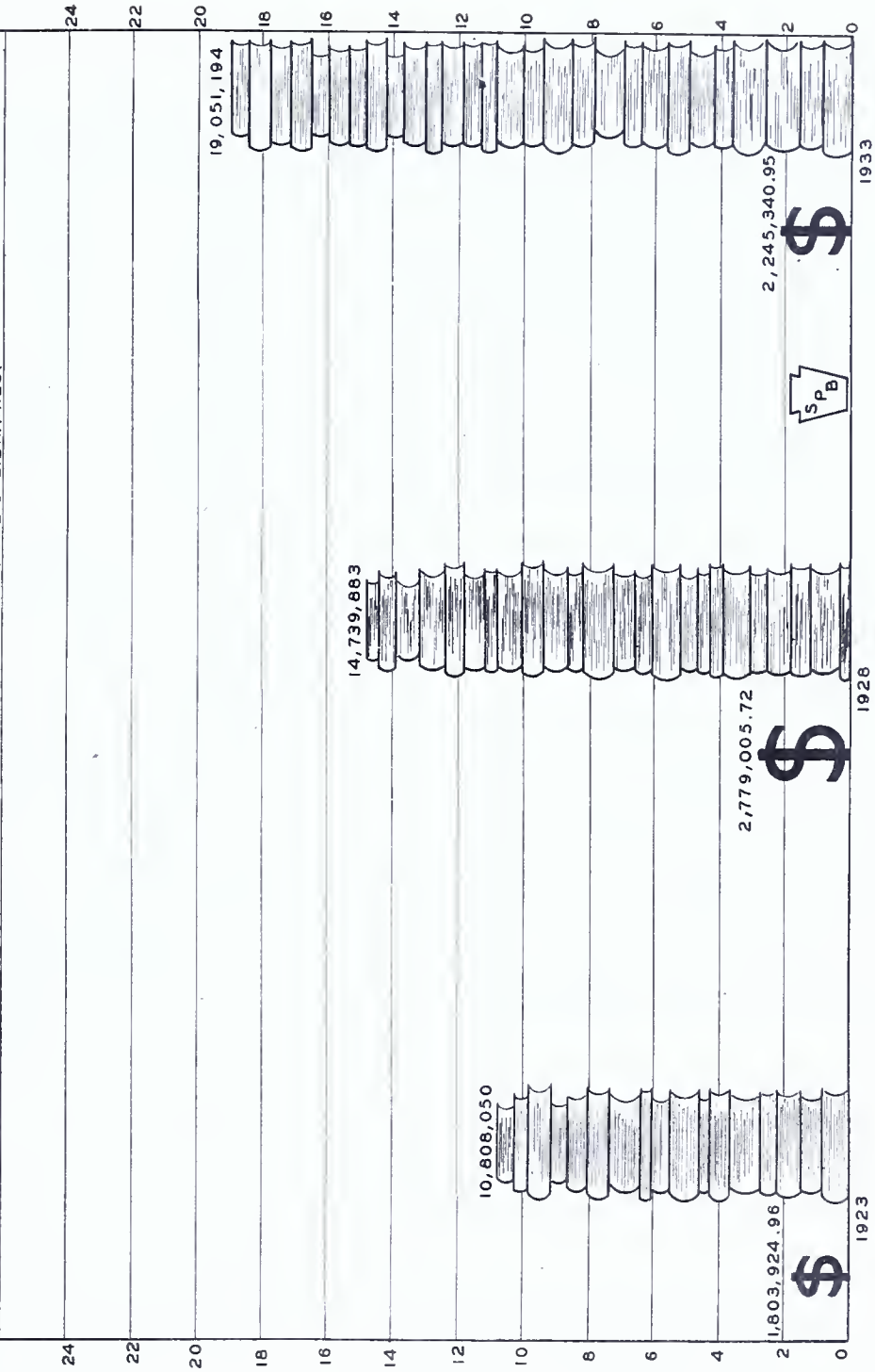
RELATION OF CIRCULATION & EXPENDITURE IN LIBRARIES

EXPENDITURES & CIRCULATION IN MILLIONS

PENNSYLVANIA • 1923-28-33

STATISTICS TAKEN FROM REPORTS OF 100 PUBLIC LIBRARIES.

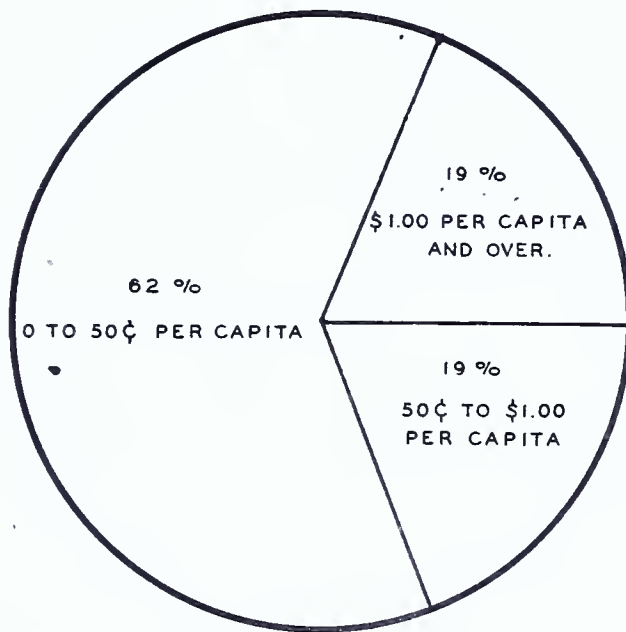
EXPENDITURES & CIRCULATION IN MILLIONS



PER CAPITA RECEIPTS - 200 LIBRARIES

PENNSYLVANIA

STATISTICS TAKEN FROM REPORTS OF 200 PUBLIC LIBRARIES.



PUBLIC SOCIAL WELFARE

Many grave problems facing the Commonwealth must be solved by the Department of Welfare. The care of mental defectives, in and out of the State's mental hospitals; child welfare, with its problems of the development of family service and study of the needs of a child away from the home; and the seemingly endless questions concerning social security - the care of the aged, the blind, the deaf, the chronically ill, as well as correctional matters, poor relief and mothers' assistance, are among the most important.

In the field of social service activities, population changes are vital in affecting policies of administration in coping with existing needs and in planning for the future. Many of them have been anticipated by the Pennsylvania Department of Welfare, as is evidenced by old age and blind pensions, mothers' assistance, improved institutional and clinical service, new methods of poor relief, community service for bettering family life, and intelligent planning for decreasing the tendency to follow crime which accompanies mass-living.

The slowing up of population growth will not mean, for some time, a lessening of social welfare activities. Rather

* Material from the Department of Welfare, with population information prepared by F. Herbert Cooper; mental health section by William C. Sandy, M.D., director, Bureau of Mental Health; child welfare section by Mary S. Labaree, assistant director, Bureau of Community Work; social services by Helen Glenn Tyson, director, Bureau of Community Work; correctional by Dr. B. L. Scott, director of the Bureau of Corrections and probation by Mrs. Gertrude Marvin Williams, Secretary, Probation Committee.

it is an opportunity to meet existing needs and to formulate a plan for a more thorough treatment of state-wide welfare problems, such as is here suggested by assembling reports made to the Secretary of Welfare by the experts in that Department.

MENTAL HEALTH PROGRAM

(Some Special Factors and Features in a Long-time Plan.)

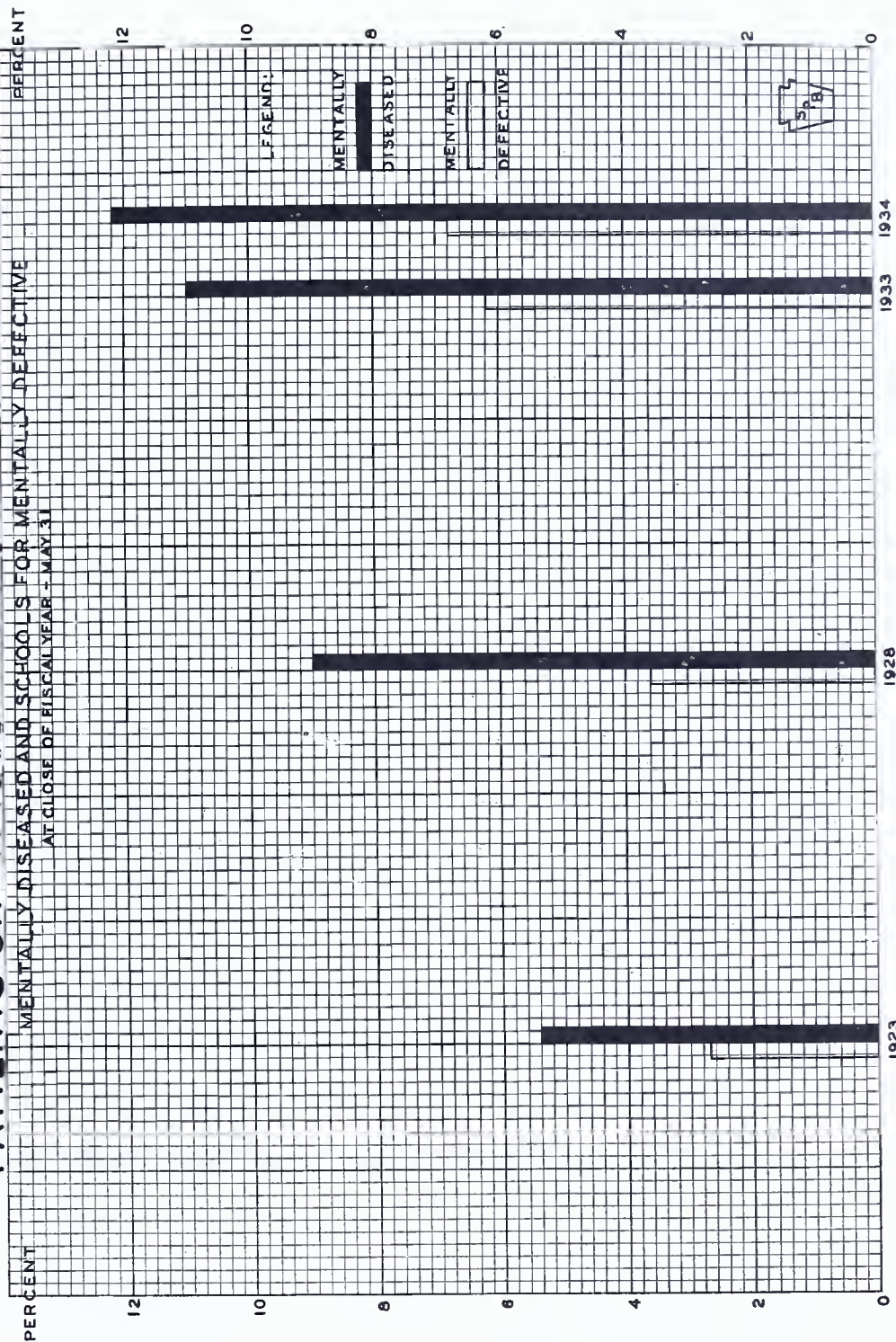
A long-range plan for meeting the problems presented by mental patients in Pennsylvania involves a number of special considerations. Included are population trends, already dealt with in this report, and the resultant need for modifying hospital districts from time to time; the effect of certain policies, such as the State's attitude on complete State care for the mentally ill; and the ever present but increasingly difficult budgetary situation.

Mental Illness

In the field of the mentally ill, a distinct trend toward complete State care has developed. This is largely the result of high standards of treatment and care afforded by the State mental hospitals as contrasted with the more limited facilities of the county institutions, which are more or less inadequate and are becoming an insupportable burden to the counties.

The ten-year building program of 1927 now requires a re-study based upon factors and trends which were not wholly anticipated. Certain districts of the State show remarkable diminution in population, others unexpected increases. Are

PATIENTS ON PAROLE FROM STATE HOSPITALS



these changes due to temporary shifts in population, because of economic stress, or to more or less permanent movements which will necessitate a modification of hospital districts? With the probable gradual adoption of complete State care and the designation of suitable County institutions as new State centers, the hospital districts will then have to be changed.

Overcrowding in the State hospitals is again becoming a serious problem. It was largely being eliminated by the comprehensive building program of 1927, which has been discontinued in recent years. No district is wholly free from overcrowding, but the Southeast, complicated by the deplorable conditions at the Philadelphia Hospital for Mental Diseases at Byberry, the Torrance district serving the West and the Warren district serving the Northwest, are especially serious. The needed expansion of hospital facilities if delayed too long, will force the abandonment of the creditable policy of receiving all mental patients needing hospital treatment and care. It may also restrict admissions to those who are troublesome in the community. In the interests of all mental patients, such a backward step must not be considered.

Long-time Planning to Relieve Hospital Overcrowding

Relief from overcrowding in institutions and preventing the development of such deplorable conditions can be brought about only by long-time planning and a comprehensive construction program. Such a program must take into consideration not only the needs of a single institution as such, but also

its requirements in relation to the State as a whole.

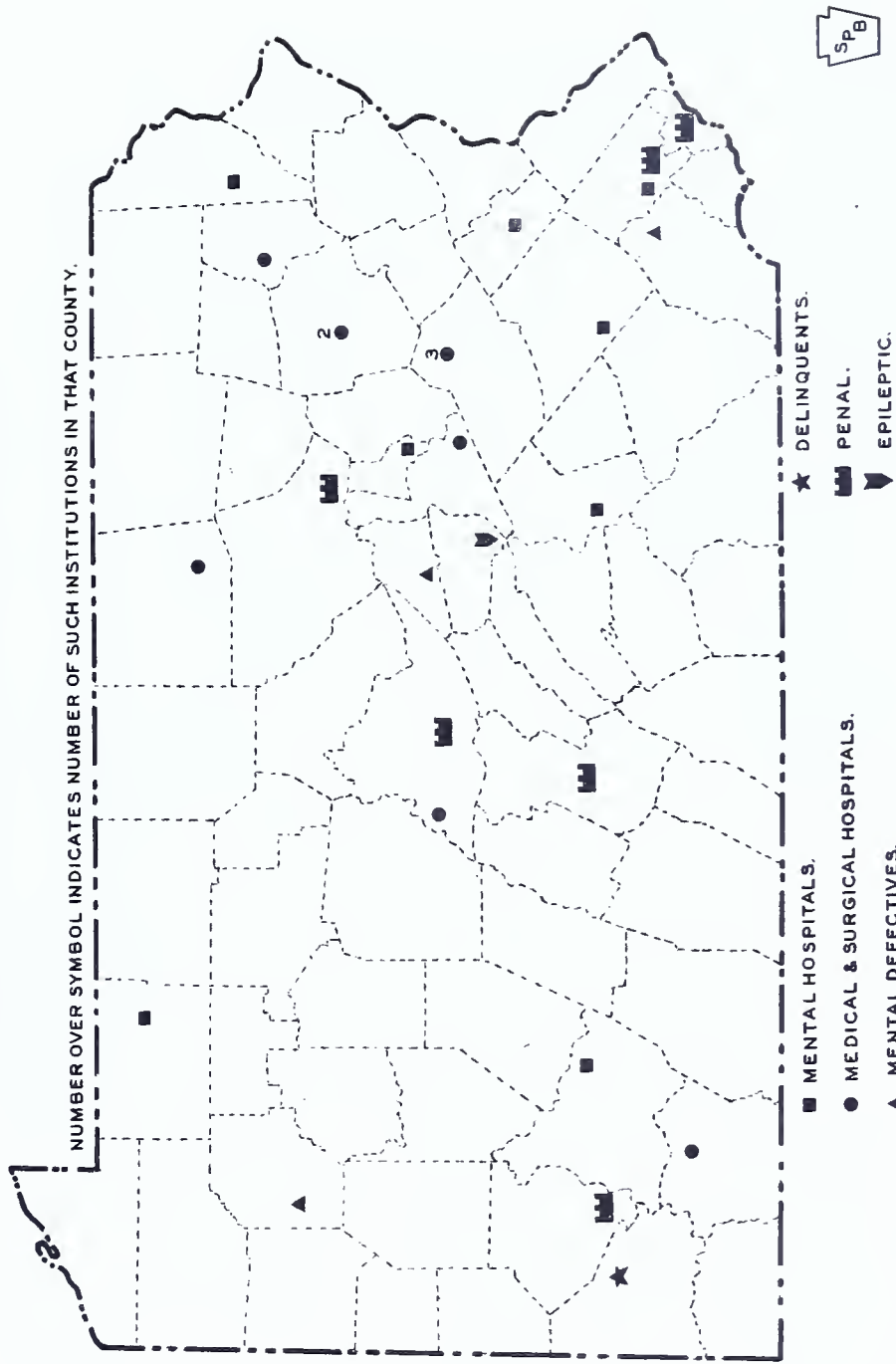
Certain trends and contemplated policies encourage optimism as to the future. A growing adequacy in psychiatric social work has resulted in greatly increasing the number of State mental hospital patients on parole and the ultimate recoveries. The possibilities in this field are still incompletely utilized in a number of hospitals not having an adequate staff of social workers.

The boarding out of suitable mental patients in carefully selected private homes is under consideration. If the necessary amendments to the mental health law, now being studied, are finally enacted, this may result ultimately in provisions for hundreds of patients in the community who now have to be maintained in hospitals. The process will be a slow one, however, with no immediate prospect of relief in this manner for the overcrowding of institutions.

With the mental hospitals so crowded, general hospitals, which often have a large percentage of unoccupied beds, should realize their opportunity and responsibility in respect to mental patients. General hospitals, if provided with psychiatric consultants and nurses with mental hospital experience should be prepared at least to admit for observation patients pending commitment and for the intensive study and treatment of selected cases, probably of short duration.

The state mental hospitals housed on May 31, 1934, 1301 patients seventy years of age or over. Those seniles who may

STATE OWNED INSTITUTIONS



PENNA. DEPARTMENT OF WELFARE.

FIGURE NO. 145

STATE AIDED INSTITUTIONS

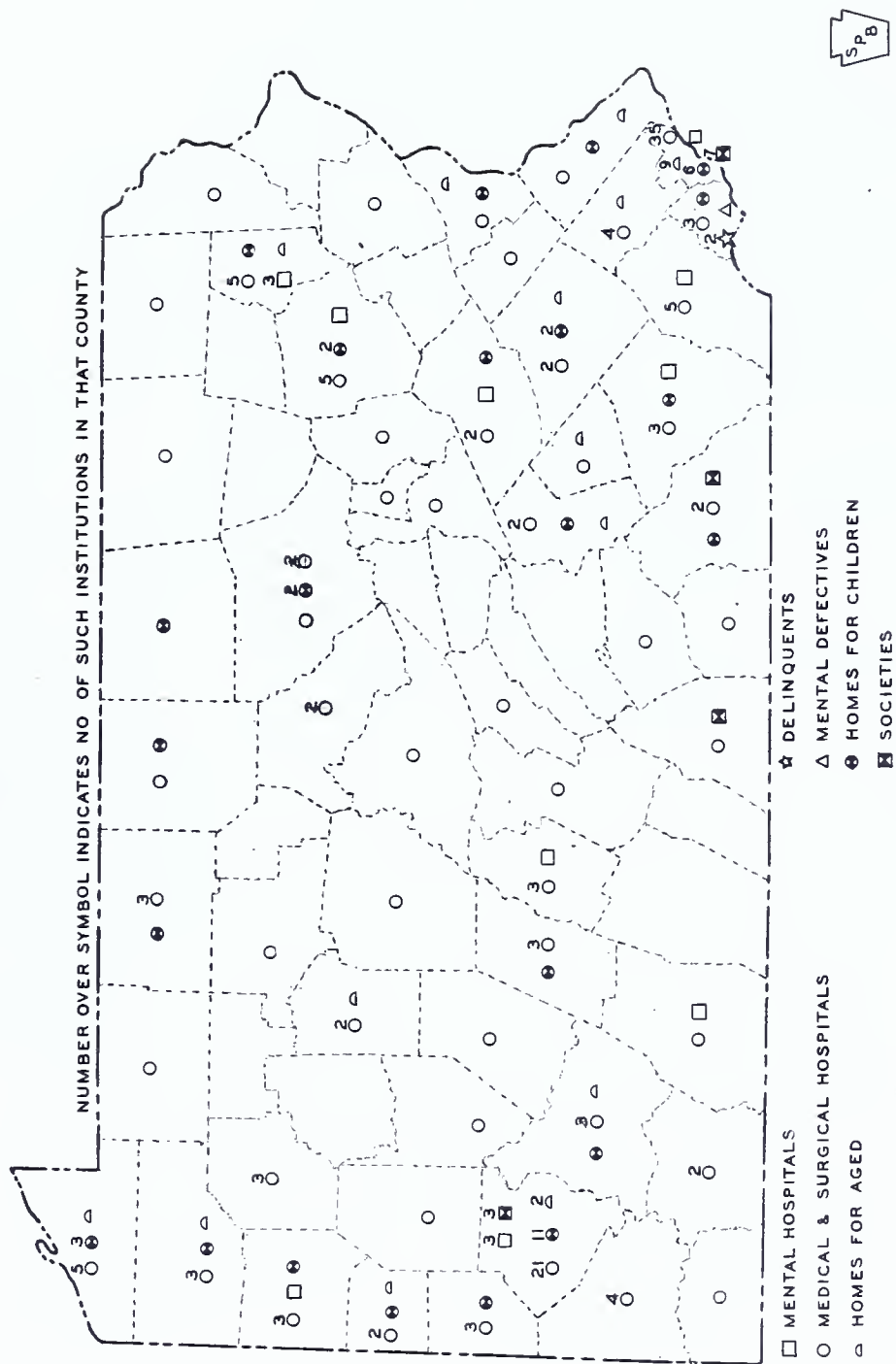


FIGURE NO. 146

have recovered sufficiently from active psychotic symptoms or who have deteriorated into a quiet inactive status, should be studied as possibly suitable for return to county homes, or to their own homes supported through the old age pension system.

Mental Clinics offer the most hopeful opportunity for prevention. The policy of stimulating the establishment and conducting of more general mental clinics by the hospitals in their districts should result in decreasing the institutionalization of borderline cases and in assisting paroled patients to remain in the community. The objective of a child guidance clinic in each hospital district, the policy of the Bureau of Mental Health, when attained, should result in saving many children from future difficulties, and in the general education of the public in the principles of mental health.

Mental Deficiency

In the field of mental deficiency, it is now recognized that institutionalization of all cases is not only impossible because of the numbers, but also unnecessary if adequate educational facilities and community supervision are provided. In Pennsylvania with only 5406 State institution beds and a waiting list of more than 2600, need for at least twice the number of institutional beds is estimated. When adequate special class facilities are provided in the public schools, the trend will be toward more and more high grade mental defectives remaining in the community.

In 1927, the mental health law was amended to permit the

colonization of selected mental defectives, but owing to the limitations of the appropriation act, it has never been tried. In a neighboring state, under similar conditions, the capacity of one institution was ultimately increased by 1,000 beds, with advantage to the patients concerned and at a great saving of expenses.

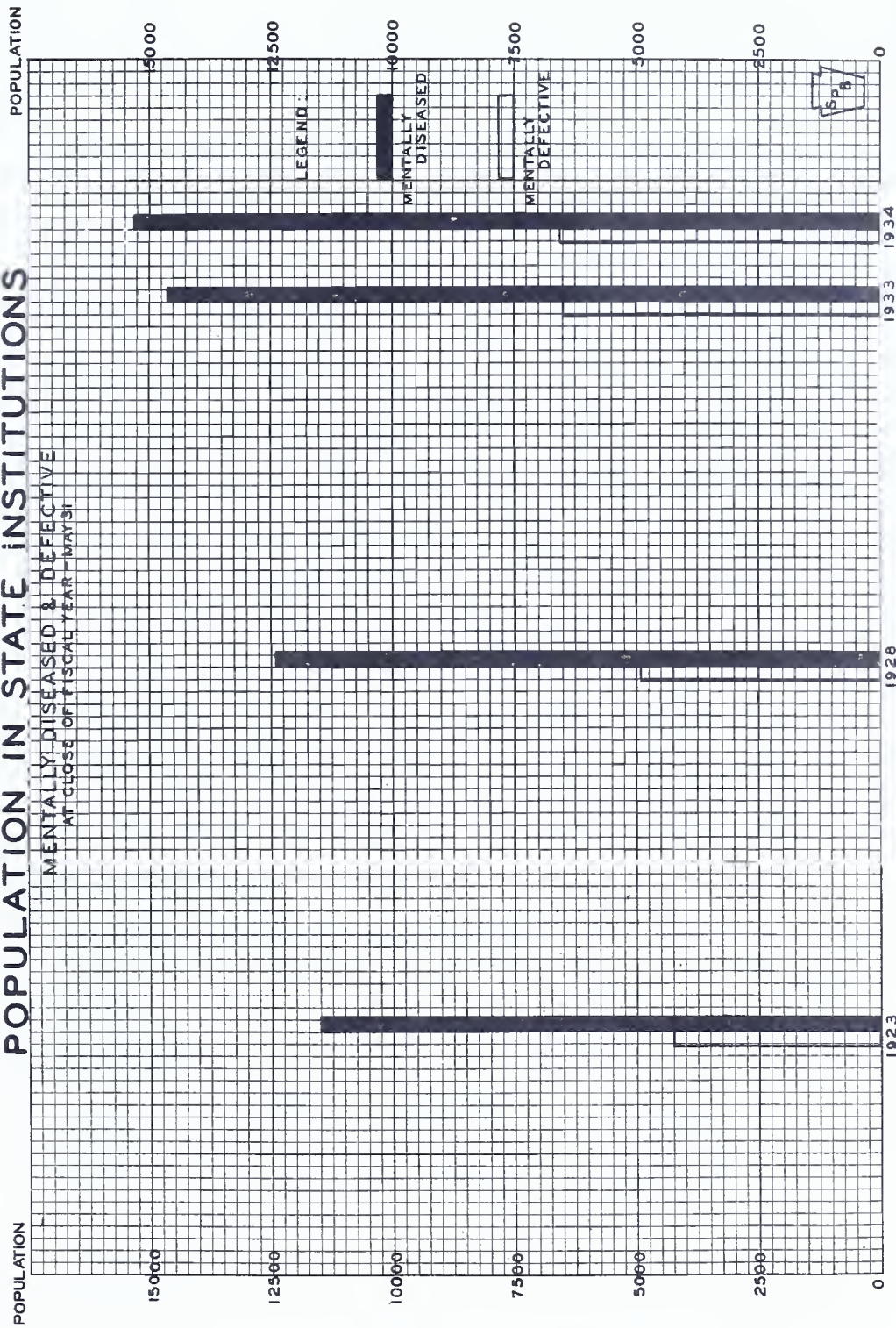
While sterilization is by no means the panacea which its most sanguine advocates believe, yet it should be considered at least in selected cases of mental deficiency. Sterilization would be especially useful in those cases sufficiently trained to return to the community but who have to be retained in institutions because of an obvious danger of reproduction of their kind.

The proposed Cumberland Valley Institution for Mental Defectives (Male Defective Delinquents) will relieve penal and correctional institutions. It will also provide accommodations for the desirable long-time supervision of delinquents of low mentality for whom there are at present no suitable places.

The Selinsgrove Colony for Epileptics, still in the developmental stage, has accommodations for only about 400 adult male patients. The colony should be more rapidly expanded, with facilities also for women and children, thus making it possible to receive for treatment all classes of epileptics, and relieve the other institutions for mental patients of some 2,000 cases.

POPULATION IN STATE INSTITUTIONS

MENTALLY DISEASED & DEFECTIVE
AT CLOSE OF FISCAL YEAR - MAY 31



Finally, no comprehensive program for mental patients will be complete without organized research activities. The proposed Western State Psychiatric Hospital, for which a site has been donated by the University of Pittsburgh, will be the center of psychiatric inspiration for the State, a place for the intensive study and treatment of selected cases and for the education of physicians, nurses and others in the treatment of mental illness. With the increasing number of patients and mounting costs, the Commonwealth cannot afford to neglect facilities for an organized effort to discover more adequate methods of prevention and cure.

CHILD WELFARE

The census of dependent and neglected children taken by U. S. Bureau of Census as of December 31, 1933, shows that 29,737 Pennsylvania children were cared for away from their own homes on that date. Tabulations now being made are bringing out interesting facts about these children. They will show, for instance, how many are supported in whole or in part from public funds; how many children of widows are being cared for away from their mothers despite state and county appropriations for mothers' assistance; how long children have been under care; the counties where they now are compared with the counties from which they came.

It is hoped that this Federal Census will help the Pennsylvania Department of Welfare to plan better social statistics

in the children's field and to devise a means for bringing the census findings to the attention of the public.

Family Service

Care of Child away from Home

The great number of children cared for away from their homes emphasizes the need for a better development of family service agencies. Adequate relief and social case work that helps to solve fundamental problems of family life and individual maladjustment would reduce the institutional and foster home load of children now apparently in need of special care. Already the widespread and fairly well coordinated program of federal and state unemployment relief is holding many families together that might have broken down. We need more definite data on the relationship of family service - public and private - to the care of children. We need to know the real effect, especially in those communities where there are adequate family agencies, of this family care.

The Age 16 - 21 Group

The problem of those sixteen to twenty-one years old has hardly been touched. Nowhere is there a real program for them. Institutions and foster home agencies are overweighted with these young people because neither they nor the communities have a plan. Vocational guidance and training is necessary. Many boys and girls outside of the care of organizations need direction and help. The falling birth rate and rising age of children to be cared for should present to children's

institutions the need for possible re-drafting of their programs. The need for changing their policies to meet the need of older children rather than to continue care of normal children under twelve years of age should be faced.

Juvenile Delinquency

The reason for a decrease in juvenile delinquency should be explored. Is this due to greater leniency on the part of arresting officers, a desire to economize on the part of county officials, or an actual decrease?

No. of Family Agencies (private) in Penna. (prior
to '31) and budget

22 Private Family Agencies spent \$1,247,350.38
in 1929. (Dept. of Welfare records show 50
Family Societies (private) listed.

No. of child caring agencies (private) in Penna.
(prior to '31) and budget

116 child caring agencies, but no record of
budget available.

No. of counties reporting:

Family Welfare Societies	28
Child Caring Agencies	48

County costs for Family Care in 1933	\$6,493,722
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County costs for Child Place- ment in 1933	\$5,097,760
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SERVICES AND CARE OF SPECIAL GROUPS
(Exclusive of Children and Unemployed)

Care of the Aged

At present Pennsylvania offers the following types of care to dependent aged:

- Private sectarian or fraternal homes (about 100)
(Fee required in most homes)
- State-aided non-sectarian homes for the aged (25)
Fee
- Almshouse (85) (Inadequate care)
- Outdoor relief (Inadequate relief)
- Private family agencies (Small number of cases)
- Old age assistance December 1, 1934
(Strict limitations in law)

The objectives in the care of the aged seem to be:

- (1) Insurance system for workers now employed, applicable to as large a number as possible.
- (2) Old age assistance to the present aged, to include a liberalizing of present law and dropping the age from 70 to 65 years.
- (3) Institutional care for the infirm aged:
 - (a) State supervision of all private institutions.
 - (b) Regional public hospital-homes for the aged and infirm, replacing almshouses; State supervised and probably supported by State as well as county funds.

THOSE HELPED BY MOTHERS' ASSISTANCE FUND

NO. OF
FAMILIES
AND CHILDREN

NO. OF
FAMILIES
AND CHILDREN

PENNSYLVANIA • 1923 - 1934



SPB

Physically Handicapped

Except for the blind and the workers disabled by accident in industry, and certain information about crippled children, very little is known about the physically handicapped. For example, no State-wide study of the problems of the deaf has as yet been made. This field, considered as a whole, should be explored as to prevention, retraining, vocational guidance, placement and relief.

The Care of the Chronically Ill

Aside from a few private institutions with prohibitive waiting lists and admission fees, Pennsylvania offers nothing in the way of institutional care of the chronically ill except almshouses. Only five of the eighty-five almshouses may be defined as hospitalized, with even a minimum of regular medical and nursing service.

This field should be explored with a survey of the need, present provisions, and plans for the future.

Assistance to Mothers

Even with the strict limitations of the law granting relief only to widows and wives of men in mental hospitals, biennial appropriations have never been sufficient to care for the entire waiting list. The question of liberalizing this law to include assistance to other dependent families such as those of men in the penitentiary, or men in State tuberculosis sanatoria, deserted wives, unmarried mothers, should be considered. Planning must relate to the plans for county boards

of welfare.

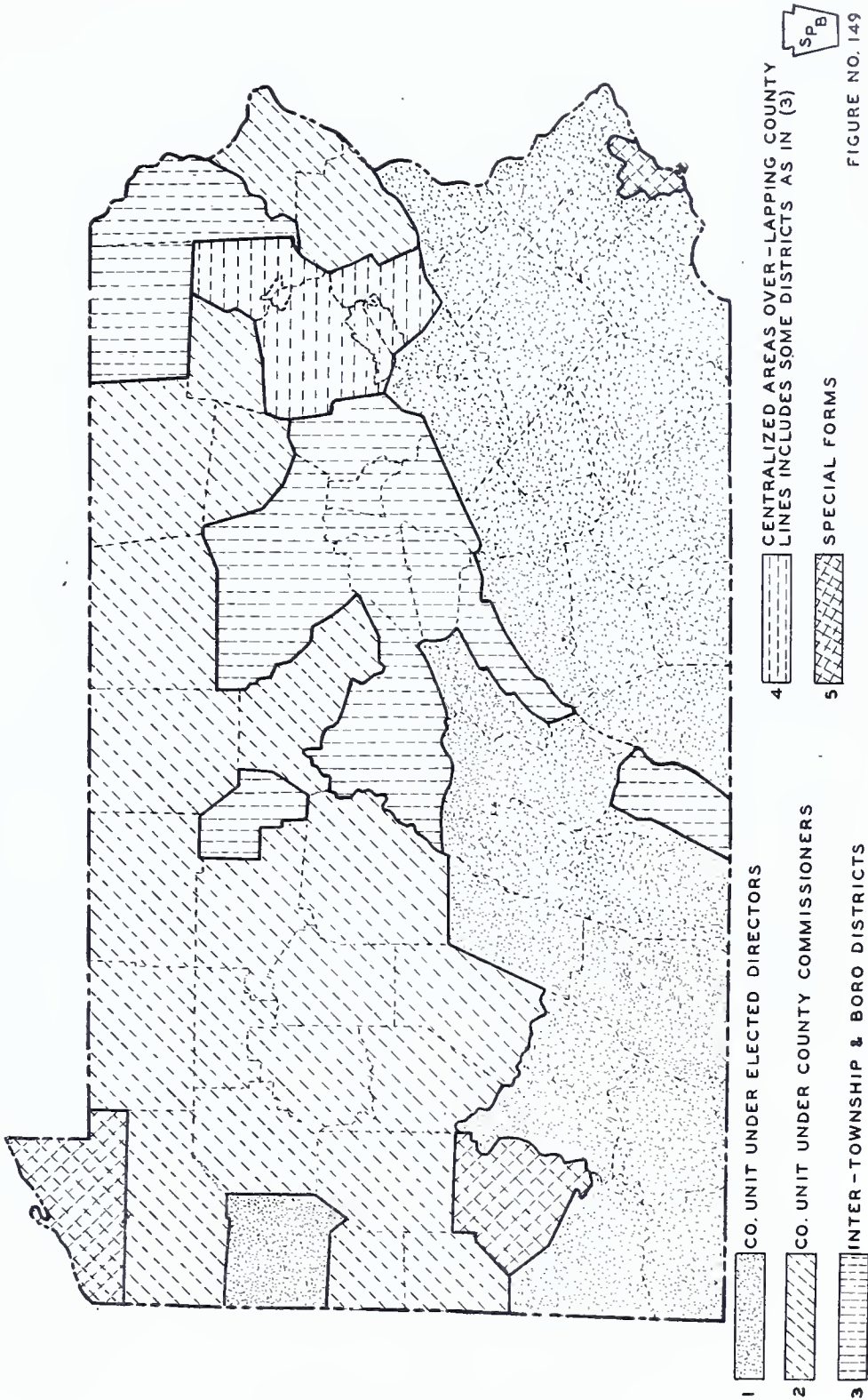
Poor Relief

The Poor Relief Study shows the costliness and futility of maintaining a substratum of relief administered on a lower level of service and relief grants than is received by groups such as the widows and the blind. Poor relief is at present a catch-all with no defined field, no clear policies, no standards. Forty of the eighty-five almshouses could be closed even without planning for new institutions, provided that the populations of the other almshouses were analyzed, the able-bodied given care in the community and the inmates now in the forty smaller almshouses boarded in the larger institutions.

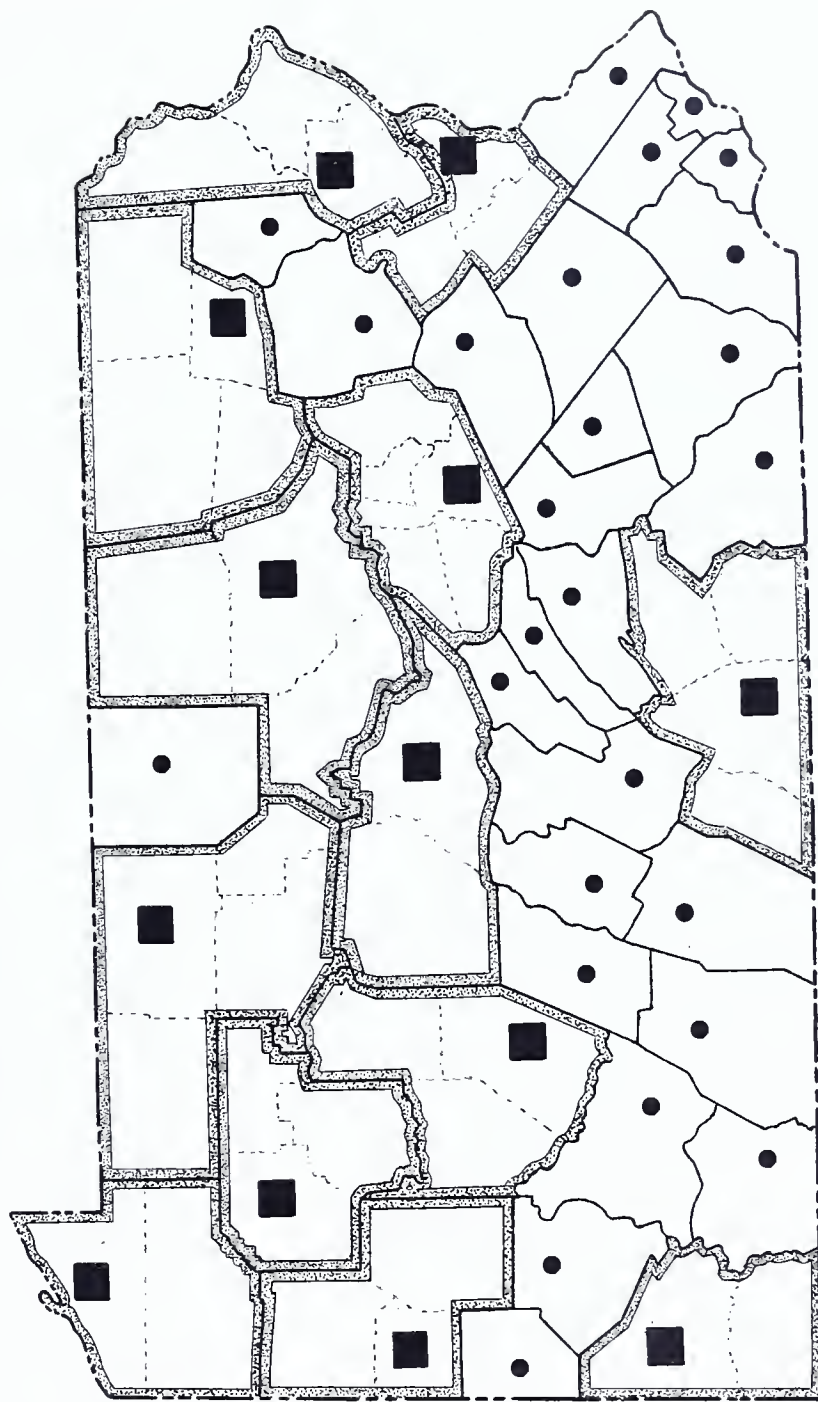
Under the plan for county boards of welfare, some of the injustices of our present relief measures, which maintain different groups of people at different levels of care, would be eliminated.

The Welfare Department would consider no relief measure adequate that did not coördinate unemployment relief with other relief activities. At present, although the lines of administration are clearly defined, it becomes daily more evident that the needs of a family must be considered as a whole and not on the basis of the need of one or more individuals in the family.

TYPE OF POOR RELIEF ADMINISTRATION



ADMINISTRATIVE SUBDIVISIONS OF STATE EMERGENCY RELIEF BOARD •



■ AREAS EMERGENCY RELIEF BOARD

● COUNTY EMERGENCY RELIEF BOARD

CORRECTIONAL

The last ten years have witnessed many changes in the field of penology and prison administration. A definite movement is apparent today in the nation away from the old philosophy of imprisonment for punishment to the newer view of imprisonment for rehabilitation. This trend, both in policy and practice, serves to bring out the weakness and, in many cases, the inadequacy, of the present penal system in Pennsylvania.

In the development of any new system, State Industrial Prison Farms should take the place of County prisons, which in turn should be used for short term prisoners only. While it is true that a number of Counties are talking of regional prison farms, ultimately all of the institutions in which offenders are housed should be under the jurisdiction of the State. England, from whom we took our system of county prisons, has long since abandoned such local institutions, and all places of confinement are under the central government. The State could be divided into districts; the present industrial prison farms acquired and new ones planned. The State would bear the cost of erection, but the maintenance could be prorated among the Counties in the districts, depending upon the number of prisoners committed from the Counties. Such a system would provide for better management, uniform regulations, more adequate standards for both housing and program,

and standardized parole procedure.

State Prisons

The Eastern State Penitentiary and Western State Penitentiary are the oldest State penitentiaries in Pennsylvania.

The New Eastern Penitentiary at Graterford and the Rockview Prison Farm at Rockview are their annexes. They have met an essential need since Eastern State Penitentiary is in a residential and small business section of the city; the Western State Penitentiary is in a manufacturing area. Neither of the old institutions has proper facilities nor the necessary ground for expansion or recreational space necessary for the newer program.

The original plan at Graterford called for a housing capacity of 3,200 inmates. A prison of this size is not practicable, and accordingly, plans have been changed so that not more than 2,000 inmates are to be housed there. Even this is too large a number unless the prison population is composed of selected individuals. It is necessary to plan for another prison to serve the eastern section of Pennsylvania and to replace the old Cherry Hill institution in Philadelphia. The new institution should be located on a farm tract away from the city but accessible to it. It should be for a population of not more than 1,500 and preferably not more than 1,200.

A farm tract near Pittsburgh should be obtained for the Western State Penitentiary, and an institution of medium security erected providing for the proper handling of not more than 1,500 inmates and preferably 1,200.

Industrial School

The Pennsylvania Industrial School at Huntingdon was built as a penitentiary to serve the central part of the State, but was later turned into a State Reformatory. The structure is poorly adapted for the purposes of an Industrial School, but might well serve as a prison of medium security for 1,000 or 1,200 inmates. A farm tract should be secured on which could be erected inexpensive, modern type buildings which would provide for a real Industrial School for offenders between the ages of fifteen and twenty-five. This would complete a classification plan of penal institutions for males, with the exception of one for male defective delinquents which the State has long planned to build on the ground owned by the Commonwealth near New Cumberland. Such an institution is badly needed, as there is a group in each of the present existing penal institutions which probably should be housed in a separate institution for male defective delinquents. These groups constitute the troublesome individuals in any normal prison population as far as administration and program are concerned.

If such changes as here advocated were made, Pennsylvania would have minimum, medium and maximum secure prisons, adequate in capacity to serve the Commonwealth for the next fifty years. In addition, the facilities would be such that the newer and modern conceptions of prison administration and penology could be put into effect under trained leadership.

County Prisons and Jails

Perhaps the outstanding weakness in the penal system, not only in Pennsylvania but throughout the nation, is to be found in county prisons and municipal jails. For years students of penology and criminology have declared these local institutions to be mere schools of crime.

For the year ending Dec. 31, 1932, the sixty-nine county penal institutions cost the taxpayers of Pennsylvania \$2,652,860.69 for maintenance expenses only. This figure does not include the maintenance cost of the 702 city, borough, and township lock-ups for which no reliable figures are available. On any given day nearly nine-tenths of the penal population of the State is to be found in these county prisons and local jails. By every measuring stick these places are failures; they neither offer the protection that society demands nor do they have any program of rehabilitation.

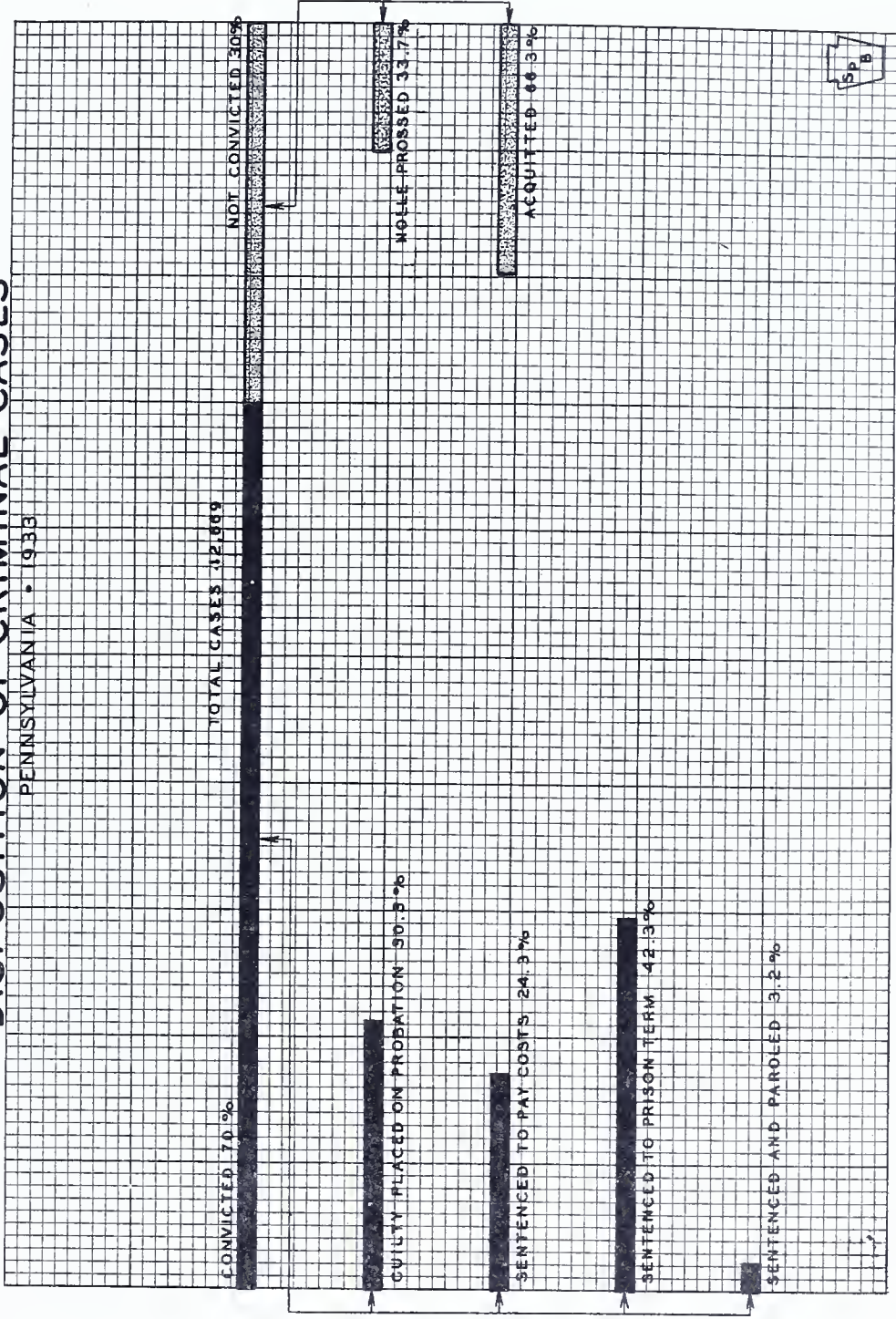
Prison Farms

As a substitute for existing county prisons and local lock-ups, thoughtful citizens and students of penology have recommended the Industrial Prison Farm. This type of institution offers hopeful prospects for rehabilitation of the individual and is cheaper to maintain.

Most of the county prisons in Pennsylvania were built years ago on limited tracts of ground. They are generally found in congested areas in County seat towns, their buildings unsuited for modern sanitary equipment, and with no opportunity

DISPOSITION OF CRIMINAL CASES

PENNSYLVANIA • 1933



for modern penal practices. Two counties have since built new institutions known as Industrial Farm Prisons. These are modern buildings, erected on tracts of ground of sufficient size to offer opportunity for farming and truck gardening, dairying and the raising of stock and poultry. In addition, there are a number of work shops for inmates who are unable to do outdoor work. Many of the larger counties in the State are in need of similar institutions, which should not exceed 1,000 in capacity and preferably might be for a population of considerably less.

Many of the smaller counties are not in a position to undertake such a project by themselves, but a State law provides for the joint construction by any two or more counties of an Industrial Farm and Workhouse. A considerable part of the upkeep could be met by the raising of farm and truck produce, stock and poultry, while the work shops could turn out articles for the use of inmates and those of other institutions maintained by the counties.

Women Offenders

Apparently there has been no State planning for women offenders. Thousands pass through the Courts of Pennsylvania, both Courts of Record and those of the minor judiciary, but there is no well defined program for handling their cases. Many are warned to leave town; others are given sentences of such short duration that no health or rehabilitation program can be made. The present penal institutions, with few ex-

ceptions, have no adequate facilities for handling women. There is no uniformity of policy in regard to commitments or of disposition of their cases. Many women are found in the larger county prisons who have served scores of short sentences and who are released only to be returned after a short spell of freedom.

In planning a definite program for handling erring women, a survey should be made of the entire State as to their number, type and the social background. In some cases, sentences should be longer. In others, supervised probation might be used. But the first and paramount need is an accurate knowledge of the number, background and needs.

For the year ending Dec. 31, 1933, the total cost of maintaining the sixty-nine county penal institutions in Pennsylvania was \$2,589,313.92, which sum was paid entirely by the Counties. For the year ending May 31, 1934, the cost of running the four State penal and correctional institutions was \$2,394,355.54. A portion of this expense was borne by the Counties according to the number of commitments; the remainder came direct from State appropriations. The combined cost to the taxpayer of both State and County penal institutions is \$4,983,669.46.

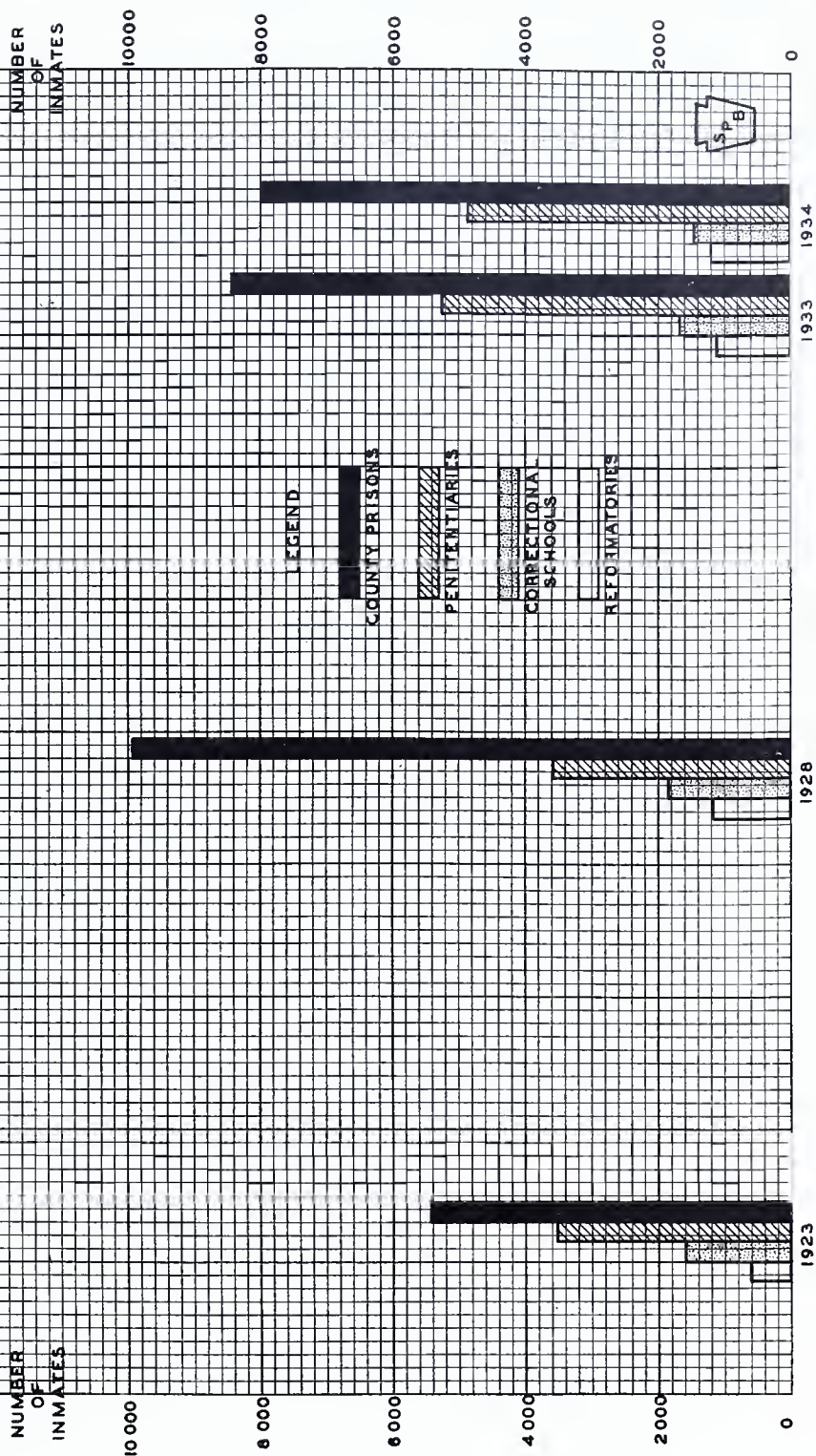
PROBATION

Probation is important as a crime preventive measure. Properly administered, it prevents chances of offenders developing into criminals through the undesirable associations

POPULATION IN STATE PENAL INSTITUTIONS

PENITENTIARIES, COUNTY PRISONS, REFORMATORIES & CORRECTIONAL SCHOOLS

AT CLOSE OF FISCAL YEAR - MAY 31
PENNSYLVANIA • 1923-1931



of prison and reform schools; unnecessary costs to taxpayers of maintaining additional inmates of prisons and correction schools; loss to society at large through anti-social acts of potential criminals.

A survey prepared for the Pennsylvania Committee on Probation by the Division of Research and Statistics of the Department of Welfare, shows among other things that the use of probation in Pennsylvania is confined to the larger Counties, whereas it should embrace all Counties of the State. It also shows a discouraging failure to understand or apply the real principles underlying probation even in most of the Counties which go through the form of using it.

In any future program the first essential should be a general educational campaign to remind courts, public officers and the public in general of the existence of probation and to teach them how to put it into practice.

The second essential should be to secure the coöperation of the Bench, as the efficiency of a State probation system is absolutely dependent upon whether Judges are willing to use the system and how intelligently they use it.

The third and no less important essential should be to establish rigid standards and qualifications for appointment of probation officers.

TABLE A

EXPENDITURES FOR PRINCIPAL FORMS OF SOCIAL RELIEF BY PENNSYLVANIA
STATE AND LOCAL GOVERNMENTS BY FISCAL YEARS FROM
JUNE 1, 1927 to MAY 31, 1935

	1929-30	1930-31	1931-32	1932-33	1933-34
Unemployment Relief (1)	\$ 9,517,725	10,710,963	\$ 9,297,829	\$21,910,108	\$33,840,952
Poor Board Relief (2)	2,715,438	2,715,438	12,483,642	13,340,448	13,348,271
Mothers' Assistance	17,500	17,500	3,851,840	3,851,840	4,115,938*
Veterans' Relief	16,505	16,505	162,134	162,134	105,000*
Assistance to the Blind			33,924	33,924	880,000*
Old Age Assistance					2,000,000*
Vocational Rehabilitation	47,289	43,471	50,756	61,231	74,311
State Aid to Home and Hos- pitals for Free Service*	4,816,750	4,816,750	5,587,661	5,587,661	5,777,868
State Owned Institutions (Free Service) (3)	3,792,097	3,792,097	3,794,778	3,794,778	3,399,892
Tuberculosis Sanatoria and Hos- pital for Children (Indigent)*	1,055,126	1,055,126	809,182	809,182	596,500
Administration of Workmen's Com- pensation	185,535	185,535	155,019	155,019	165,000
School Employees' Retirement*	5,900,000	5,900,000	6,010,000	6,010,000	5,695,000
State Employees' Retirement	878,750	878,750	870,000	870,000	850,000
Employment Offices	88,147	87,869	99,637	121,477	73,773
TOTAL	29,030,862	30,220,004	43,206,402	56,707,802	70,722,505

* Appropriations (approximately the same as expenditures)

- (1) The \$10,000,000 appropriated by the State under the First Rabbot Act and administered by the poor boards is included under unemployment relief and NOT under Poor Board Relief.
- (2) The figures for Poor Board Relief do not include expenditures of local governments for relief purposes not made through the poor boards. The Total amount of such expenditures is not known.
- (3) Appropriations less receipts from patients able to pay for service received.

Corresponding totals for 1927-28 - \$25,683,975, 1928-29 - \$29,748,214

(Table by W. C. Plummer, Ph.D.)

PLANNING THE REORGANIZATION OF PUBLIC RELIEF
IN PENNSYLVANIA*

Pennsylvania faces an increasingly complicated problem in the matter of social relief. Formerly, two main channels, the county poor boards and private agencies were used, but the recent tendency has been to earmark State appropriations for special groups. Nowhere in the field of local government nor in that of welfare effort is the need for planning more apparent.

The Commonwealth has six forms of public relief: Poor relief, mothers' assistance, veterans' relief, unemployment relief, pensions for the blind and old age pensions. They are organized as follows:-

Poor Relief: This basic form of public assistance was established in 1682 and approximately 1400 separate laws relating to it are on the statute books of the State. Seven different forms of organization include:

County unit poor districts with County Commissioners acting as Directors of the Poor	22 counties
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County unit poor districts with three elected and salaried Directors of the Poor in each county	27
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Township, borough, and combination inter-township-and-borough poor districts	12
--	----

Township, borough, and combination districts, with certain districts including parts of two counties	3
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*Information essentially from Arthur Dunham, Secretary, Family and Child Welfare Division, Public Charities Association of Pennsylvania and from Mrs. Gertrude Marvin Williams, Department of Welfare.

City Department of Public Welfare in
Pittsburgh; remainder of Allegheny County
a poor district with three elected
Directors of the Poor 1

City and county coterminous; city
Department of Public Welfare, with
six independent poor districts in
certain sections of the city
(Philadelphia) 1

County unit poor district with three
unpaid Directors of the Poor appointed
by Court of Quarter Sessions (Erie
County)

1
67 counties

In the 67 counties there are 85 almshouses, 425 poor districts, and 966 directors and overseers of the poor. Most of the poor directors are elected and paid officials.

Mothers' Assistance was established in Pennsylvania by a permissive act of the Legislature passed in 1913. It is operative in 59 counties of the State, in each of which it is administered by a board of seven unpaid women trustees appointed by the Governor for terms of six years. The boards are subject to supervision by the State Supervisor of the Mothers' Assistance Fund, a member of the staff of the Department of Welfare. Half of the funds come from the State and half from the counties.

Veterans' Relief, instituted in 1929, is administered by the State Veterans' Commission and local veterans' organizations and other cooperating agencies. All funds for veterans' relief are appropriated by the State.

Unemployment Relief, inaugurated in 1932, is administered by the State Emergency Relief Board and by its local administrative units. Funds are derived from Federal and State Governments. The State Emergency Relief Board is composed of five ex-officio State officials, the Governor, the Lieutenant Governor, the Auditor General, the State Treasurer, and the Speaker of the House of Representatives. The local administration of unemployment relief is carried out through the agency of 13 area (inter-county) emergency relief units including 41 counties, and 26 county emergency relief units. Each area and county unit has an unpaid area or county emergency relief board and an executive and staff. Area and county boards are appointed by and are agents of the State Emergency Relief Board.

On November 17, 1934, 374,900 cases, including both families and single residents, were receiving unemployment relief, either in the form of direct relief or work. They represented slightly less than 1,500,000 individuals. These families and single individuals represented a total of about 1,333,256 individuals. Pennsylvania's unemployment relief population is almost as large as the total population of the State of Nebraska. It is larger than the total population of any one of sixteen states of the union.

Blind Pensions went into effect on June 1, 1934, and are administered by the mothers' assistance boards in the fifty-nine counties where mothers' assistance operates and by special

boards appointed by the Governor for that purpose in the remaining eight counties. The whole administration is under the supervision of the Department of Welfare. All funds for blind pensions come from the state. The state appropriation for blind pensions for the biennium 1933-35 is \$1,310,000.

Old Age Assistance went into effect on December 1, 1934, and is administered by mothers' assistance boards where they exist and by special boards in the remaining counties. The State Department of Welfare supervises administration. Funds for relief through old age assistance are derived from state appropriation, but the administrative expenses will be met by the county commissioners.

PROBLEMS PRESENTED

In the light of the foregoing facts regarding public relief, the following problems are presented:

1. How can a modern and effective basic public relief system be substituted for the archaic and generally extravagant and inefficient system of poor relief?
2. How can the number of separate public relief agencies be reduced in the interests of simplifying government and saving the taxpayers' money?
3. How can the maximum economy of relief administration be attained consistent with humane and adequate relief?
4. What is the most effective form of organization for a local public relief agency?

5. How can qualified paid personnel be obtained and retained in public relief and public welfare services?
6. What should be the sources for public relief funds?
7. What should be the relationship between the State and local public relief agencies?
8. What should be the relationship between the State Department of Welfare and the State emergency relief administration?

THE COUNTY WELFARE PLAN.

During the last year a plan of county welfare organization for Pennsylvania has been proposed, and the enactment of this plan into law at the 1935 session of the Legislature is now being advocated by the Public Charities Association of Pennsylvania and by many cooperating organizations and groups.

The county welfare plan is essentially a project for consolidating and reorganizing the public relief and allied public welfare services of the State. The five basic principles of the plan are as follows:

1. Establishment in every county of an appointed county welfare board of unpaid citizen members.
2. Appointment by the county welfare board of a paid director and staff qualified for public welfare administration. The director and members of the staff are to be appointed on the basis of a state civil service merit system.
3. Administration by the county welfare board of poor relief, mothers' assistance, old age assistance, blind pensions,

public care of dependent and neglected children and (either immediately or ultimately) unemployment relief.

4. Appropriation of both state and local funds for administration by county welfare boards for public relief and public welfare services.

5. Supervision of county welfare boards by the State Department of Welfare in order to safeguard the administration of state funds and to develop uniform standards of service throughout the Commonwealth.

Reasons for the County Welfare Plan

In support of the county welfare plan the following arguments are advanced:

1. It provides a modern and effective public relief system for the long-time public relief job instead of the inadequate and ineffective machinery of Poor Relief.
2. It would reduce the number of public relief agencies from 531 to a maximum of 67. Sixty-seven county welfare boards would replace the following existing public relief agencies:

Present Public Relief Agencies in Pennsylvania

425 poor boards	with 966 members
59 mothers' assistance boards	with 413 members
8 boards administering old age assistance and blind pensions in counties not having mothers' assistance	with 56 members

13 area emergency relief boards	with 41 members
26 county emergency relief boards	with 188 members

Total: 531 relief boards	with 1664 members
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3. It would reduce the cost of local government, and eliminate the duplicative costs involved in maintaining township and borough and inter-municipal poor districts with the resulting total of 425 poor districts in the 67 counties. It would simplify and unify relief administration and by bringing together in one organization unit these various forms of relief it would reduce overhead administration. Above all, it would yield a greater return for every tax dollar spent on these public welfare services.
4. It is a measure of tax reform. It eliminates the separately levied poor tax and centralizes further taxing powers in the hands of the county commissioners, thus reducing the number of separate taxing bodies by some 400.
5. It establishes the pattern of an unpaid citizens' board--the form of organization which has been successful in mothers' assistance. The board, under the provisions of the law and state regulations would determine matters of policy and program and would appoint

the executive director from persons certified as eligible under the civil service system.

6. This plan provides for qualified personnel on the basis of a civil service merit system. Nothing is more imperative in the field of public relief than setting up a guarantee of the integrity and continuity of technically qualified service and the absolute divorcing of public relief personnel from political pressure and patronage.
7. It provides for both state and local funds in the administration of the long-time relief job. Public welfare today must be thought of in statewide terms. Some counties simply do not have the resources to meet their local needs. The state is concerned for the welfare of every family within its borders whether the family lives in a rich county or a poor county. State funds as well as local funds are required. The principle of state equalization funds is as sound in the field of public welfare as in the field of public education.
8. It meets the need for a simpler, clearer, more comprehensive public relief policy. During recent years there has been developed a process of marking off different kinds of relief for various types of people who need relief; that is, widows with dependent

children, the aged, the blind, etc. Unfortunately, even when we have established all these various forms of relief, people still slip through the meshes of our complex relief system and yet must be taken care of just the same. The primary basis for the giving of relief is the existence of human need - not the possession of certain formal requirements of eligibility as a widow, an aged person, or some other special type of human being. A simpler, clearer, and more comprehensive relief policy implies one single, unified and well organized public agency to administer relief in a county or in a district composed of two or more counties.

Whatever may be the final decision regarding the county welfare plan it must be recognized that it is not a partisan or political proposal but a statesmanlike attempt to formulate a plan for the more effective organization of public relief and public welfare services within the state.

While the county welfare plan relates primarily to the reorganization of local public welfare services, it is obvious that the adoption of this plan will raise the additional question as to what should be the relationship in the future between the two state organizations which supervise or administer public relief, that is, the State Department of Welfare and the State Emergency Relief Board. If long-time public relief services and unemployment relief services are merged locally

a strong case is made for the merger of all state services relating to dependency. Whether this would mean merely the merger of the State Department of Welfare and State Emergency Relief Board as these two organizations now stand, or whether this would involve some further shifting of organization units within the State government is a problem of statewide public welfare planning that deserves the most careful consideration within the coming months.

EXPENDITURES FOR PRINCIPAL FORMS OF SOCIAL RELIEF BY PENNSYLVANIA
STATE AND LOCAL GOVERNMENTS BY FISCAL YEARS FROM
JUNE 1, 1927 to MAY 31, 1935

	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35
Unemployment Relief (1)	\$ 9,517,725	10,710,963	\$ 9,297,829	\$21,910,108	\$33,840,952	\$22,306,406* (2)
Poor Board Relief (3)	2,715,438	2,715,438	12,483,642	13,340,448	13,348,271	(4)
Mothers' Assistance	17,500	17,500	3,851,840	3,851,840	4,115,938*	4,115,938*
Veterans' Relief	16,505	16,505	162,134	162,134	105,000*	105,000*
Assistance to the Blind			33,924	33,924	680,000*	680,000*
Old Age Assistance					2,000,000*	2,000,000*
Vocational Rehabilitation	47,289	43,471	50,756	61,231	74,311	(4)
State Aid to Home and Hos- pitals for Free Service*	4,816,750	4,816,750	5,587,661	5,587,661	5,777,868	5,777,868
State Owned Institutions (Free Service) (5)	3,792,097	3,792,097	3,794,778	3,794,778	3,399,892	3,399,892
Tuberculosis Sanatoria and Hos- pital for Children (Indigent)*	1,055,126	1,055,126	809,182	809,182	596,500	596,500
Administration of Workmen's Com- pensation	185,535	185,535	155,019	155,019	165,000	165,000
School Employees' Retirement*	5,900,000	5,900,000	6,010,000	6,010,000	5,695,000	5,695,000
State Employees' Retirement	878,750	878,750	870,000	870,000	850,000	850,000*
Employment Offices	88,147	87,869	99,637	121,477	73,773	(4)
TOTAL	29,030,862	30,220,004	43,206,402	56,707,802	70,722,505	45,691,604 (6)

* Appropriations (approximately the same as expenditures)

- (1) The \$10,000,000 appropriated by the State under the First Talbot Act and administered by the poor boards is included under Unemployment Relief and NOT under Poor Board Relief.
- (2) The Expenditure for Unemployment Relief for the fiscal year 1934-35 will be larger than the amount indicated, but the total cannot be estimated in advance.
- (3) The figures for Poor Board Relief do not include expenditures of local governments for relief purposes not made through the poor boards. The Total Amount of such expenditures is not known.
- (4) Figures for fiscal year 1934-35 are not yet available.
- (5) Appropriations less receipts from patients able to pay for services received.
- (6) Total incomplete because figures for your Items are not yet available or are incomplete.

Corresponding totals for 1927-28 - \$25,683,975, 1928-29 - \$29,748,214.

(Table by W. C. Plummer, Ph.D.)

THE TEN YEAR PROGRAM OF CHILD WELFARE
FOR PENNSYLVANIA*

The Ten Year Program of Child Welfare for Pennsylvania is a project for promoting the welfare of children usually classified as dependent, neglected, delinquent or handicapped. These groups, estimated to have numbered 125,000 children in 1930, are today much larger because of the widespread economic distress. The program was developed as the result of three years of cooperative effort carried on under the leadership of the Child Welfare Division of the Public Charities Association of Pennsylvania. Local round tables were first held in 38 counties. Organization of a statewide program committee and a number of sub-committees followed and recommendations were evolved which were adopted at a general conference.

The 116 recommendations which constitute the plan are classified as fact finding, educational and legislative. They relate to the following eleven divisions in the field of child welfare; Fatherless children, the Mothers' Assistance Fund; Family aid from public and private agencies; children away from home (foster care in families and institutions); children before the courts, (juvenile delinquency); marriage laws and the child; the deserted family; children of unmarried parents; crippled children; children with visual handicaps; children with mental handicaps; hard of hearing children.

* Material from Arthur Dunham, Secretary, Family and Child Welfare Division, Public Charities Association of Pennsylvania.

The makers of the program realized that it was not a complete method for dealing with child welfare. It was limited in the belief that restrictions were the necessary price of its effectiveness. Recommendations were classified as primary or secondary in point of urgency, and in each case the name of the organization suggested to take the initiative in carrying the recommendation into effect was submitted.

A sample section of the plan is summarized as follows:

Division: Fatherless Children; The Mothers' Assistance Fund. Fact Finding: Study the problem of increasing grants that they may more adequately meet family needs. (State Office, Mothers' Assistance Fund.). Study further the question of where responsibility should be placed for the care of other types of dependent children not now included under the Mothers' Assistance Fund law. (Child Welfare Division, Public Charities Association of Pennsylvania.) Study further the need for revised equity ruling. (State Office, Mothers' Assistance Fund.) Education: Conduct continuous publicity to inform the public of the need for greater financial support and further legislation. (State Office, Mothers' Assistance Fund designated to call together a group of Trustees to organize a statewide committee of trustees and others.) Legislation: Secure an adequate State appropriation to clear the waiting list. (State-wide Committee noted under Education.) Extend the law to include the family where the father has been declared legally dead. (State Office, Mothers' Assistance Fund.)

Similarly, the recommendations for the section headed: "Children away from Home; Foster Care in Families and Institutions" are grouped in three classifications. Basic principles are set forth as: 1. Emphasizing the "oneness" of all child caring work, the single objective being the development of the personality of the individual child. 2. Stress the preservation of family life and the need of all children for normal family relationships.

High Lights of the Program

Some of the major objectives of the Ten Year Program as a whole may be summarized as follows:

Securing a state appropriation for the Mothers' Assistance Fund sufficient to clear up the waiting list of 2500 eligible mothers who can receive no grants at present because of lack of funds.

Employment of trained welfare workers and the giving of constructive family service by directors of the poor.

Increasing the effectiveness of the service of juvenile courts; raising the juvenile court age to eighteen; modifying the court's jurisdiction; and establishing a state probation bureau.

Development of the spirit and service of domestic-relations courts in the present courts; more effective handling of the problem of desertion, through skilled probation service and individualized treat-

ment based on careful analysis of each case.

Study of the problem of hasty marriages and proof of age in obtaining marriage licenses.

Securing legislation giving the State Department of Welfare a check on the incorporation of new welfare agencies.

Study of the laws relating to illegitimacy; and education regarding the care of the unmarried mother and her child.

Securing the fullest possible measure of opportunity, education, and training for physically and mentally handicapped children.

A coordinated state-wide program for crippled children, covering the location of cripples, examination and treatment, care, education, vocational training, and employment.

A program for visually handicapped children, including state-wide registration, medical examination and treatment, education and training, vocational guidance, and placement.

Strengthening of public schools, mental clinics, and institutions to bring about a unified program in behalf of problem children and those who are mentally ill or mentally defective.

SOME THINGS WHICH HAVE BEEN ACCOMPLISHED

A State-wide Committee on Mothers' Assistance was organized in 1931 to act as an unofficial planning group in this field and as a body to secure the adoption of needed mothers' assistance legislation. Through the efforts of this committee and other cooperating groups, the State's biennial appropriation for mothers' assistance has been raised from \$2,750,000 to \$4,115,938.

A plan for the development of county welfare boards in Pennsylvania has been formulated and a state-wide campaign is now in progress to obtain the adoption of this plan at the 1935 session of the Legislature.

The powers of the State Department of Welfare over the incorporation of private welfare agencies have been strengthened.

A new juvenile court code has been enacted and the first separately organized juvenile court in Pennsylvania established in Allegheny County.

Progress has been made in the extension of mental clinic and child guidance clinic services.

A P P E N D I X A.

STUDIES IN PROGRESS

Among the studies in progress but not completed in time for incorporation in this Preliminary Report are:

1. A coordinated program for the use of Submarginal Land
2. Power costs to Consumers
3. Federal expenditures in Pennsylvania
4. Public Health
 Distribution of medical services and facilities
5. The State and Municipalities
 Standardized financial procedure for cities
6. Unemployment and unemployables
7. Changes in Occupational trends
8. Credit facilities in Pennsylvania
9. Distribution of products - local marketing

A P P E N D I X B

RELATED STUDIES SOON TO BE PUBLISHED

The Planning Board deemed it unnecessary to make special studies of Poor Relief or of Land Taxation in view of studies that are nearing completion in these fields -

"The Taxation of Real Property in Pennsylvania" by Edward B. Logan, Ph.D., conducted as a C. W. A. and Work Division project will be available shortly.

"Administration of Poor Relief in Pennsylvania" is practically completed and ready for release. It will be published under the auspices of the Department of Welfare. This study was also carried on as C. W. A. and Work Division projects.

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